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## Editorials

### HOW CLOSE TO RUSSIA IS WISCONSIN?

Foundations are notoriously socialistic because the personnel invariably is engaged in taking away from rich men, the money that rich men whose consciences trouble them or have taken away, often by peculiar practices, from the helpless poor, to give back to the helpless poor again by methods that keep on making the helpless poor and the indigent taxpayer more helplessly poor and more indigently tax-paying.

Which is a mouthful! But so are all the "philanthropic(?)" foundations.

Just now Wisconsin is getting a nauseous mouthful of such philanthropy(?). Some of the few Americans who are still left in Wisconsin are beginning to ask questions as to where the money comes from that is starting to make a new-style *"badger game"* out of the old-style "Badger State."

The animus for this question-asking came directly when a Socialist-Progressive State Assemblyman by the name of Biemiller offered a group of six bills to the recent session of Wisconsin legislature that would provide amply and entirely for the complete socialization of medicine and its practitioners throughout the State of Wisconsin.

An eye-witness statement of the situation can be quoted neatly from an article that appeared in *The Milwaukee Journal* under date of Thursday, May 6, 1937, under the signature of Will C. Conrad and which was headed

BILLS FOR STATE MEDICINE MAKE LEGISLATORS GASP

WISCONSIN WORKERS WOULD PAY MILLIONS UPON MILLIONS ANNUALLY UNDER PROPOSALS OF ASSEMBLYMAN BIEMILLER

Coupled with what the Democratic Senator from Illinois is advocating down in Washington it would seem easier for the average American citizen to lie down and die than to try to work

if he is well or to recover if he is ill. In part the article referred to reads as follows:

By Will C. Conrad

"Ninety-five out of every 100 residents of Wisconsin treated for their ills under some form of contract medicine.

"Ninety-five out of every 100 doctors, their present private practice gone, treating people by contract.

"The whole medical profession of the state made subservient to a director of health insurance and a medical officer appointed to be his adviser.

"Residents compelled to present themselves for medical examination whenever this director so orders.

"The confidential relationship between doctor and patient—the old "family doctor" institution—destroyed.

"The ills of every patient and every family made a matter of public property, because the records of all this treatment would 'be open to inspection and be subject to being copied at any reasonable time as often as the director (of health insurance) may deem necessary.'

"All the hospitals, laboratories, dentists, nurses, even the corner drug stores, brought in under this system and made subservient to it on pain of the destruction of their business or profession.

"In short, the complete socialization of medicine and the care of the sick in Wisconsin.

"Finally, the collection of some $26,000,000 a year from the toilers of the state, and from their employers, to be expended as the director of health insurance might see fit—to be spent by a bureaucrat who need not be a doctor, who would not be under civil service, who might even be a politician getting his job through political pull.

"This would be the result in Wisconsin, according to medical men and the studies they have made, of the enactment by the legislature of a group of six bills offered by Assemblyman Biemiller (Soc.-Prog.) of Milwaukee.

"The bills have even veteran legislators gasping, especially in view of the fact that they carry every evidence of having a lot of force or "push" behind them. They have aroused the medical profession to determined opposition. But as yet the public knows very little about them. What they are, what provisions they contain, where they would lead, should be of wide public interest.

"Bill 852-A is the key bill of the group, designed to take in all the industrial workers of the state and all the office men and women whose salary is not more than $3,120 a year. Each employe would pay 2% of his wages into the fund and his employer 2%. The employe earning $10 a week would have $10.40 deducted from his pay for a year; the employe who earned $30 a week would be minus $31.20 in his pay envelopes; and the $60 a week worker would pay $62.40 annually.

"This money, flowing in like magic—thirteen millions from the 1,645,000 wage earners and thirteen millions from their employers—would all be spent by the director of health insurance and his advisory men and bodies, without even the supervisory powers of the state insurance laws to stay their hands. It would go to contract doctors, who would treat the sick either on a fee basis or on a per capita basis at a fixed rate a year; to hospitals, laboratories and other branches of the healing art, working under contract; to a tremendous office force supervising all this; to still other employes going out over the state to make medical investigations. If there was money left over it would be piled up in a fund to be invested by the state annuity and investment board.

"But suppose there were not enough money to go around to meet all the illness—and the doctors say there would not be if the present high standards were maintained—then what? The director would have the power to reduce the amount of service patients could get any time the director felt that was necessary.

X-Rays Would Be Out First

"And that is what would happen, according to Assemblyman Biemiller. When he was before the house of delegates of the state medical society in conference on these bills, he was asked where cuts could be made if they were necessary. He said the director would probably begin on such things as the x-ray—in other words, *the parts of the medical service to be cut out first would be the things that the poor man now finds it difficult to get.*

"For all this money paid in, the worker would get for a stated number of weeks just such medical service as the director of health insurance decreed and no more. If he went to a hospital

he would get accommodations at the 'lowest per diem rate' that the institution afforded. By the very terms of the law, he would get the poorest that the hospital had.

"Under this plan, say the State Medical Society of Wisconsin and the Wisconsin Hospital association, there would be a gradual lowering of standards in the treatment and care of disease, just as there has been a lowering in those European nations which have adopted state medicine. Gone would be the incentive of the doctor to keep his practice on the highest possible plane, for he would be just a contract man, going wherever he was sent.

"Gone, too, would be the incentive of the hospitals. The only way they could survive would be by constantly lowering their service to meet this 'lowest per diem rate' dictum of the law.

"Gone would be all incentive to push the realms of medicine out by discoveries. No 'contract medicine man' would spend time on that. And the great field of preventive medicine would disappear, as it has almost disappeared in England under a state plan. The doctors would be too busy taking care of cases assigned them by the bureaucrats. They would not be interested in research.

"The second most important of the bills is 850-A, which would authorize the formation of co-operative associations for medical and hospital care. This bill would take care of the rural sections of the state, just as 852-A would take care of the industrial and metropolitan sections. The system would all be by contract and the paying in of money. It would mean accumulation of funds which again would be outside the protection of the insurance laws of the state. These organizations would not have to provide any capital reserves to assure continued service, such as an insurance company would have to do if it went into health insurance.

### Counties Could Build Hospitals

"But to go on down the line with Mr. Biemiller's bills—

"Bill 748-A would permit counties to erect joint hospitals and employ staffs and physicians to treat, not just the indigent and the low income groups, but all comers, rich and poor, at the taxpayers' expense. This is state medicine with a vengeance.

"Bill 747-A would permit towns, cities, villages and counties to employ and subsidize physicians, the treatment of the sick to be placed directly under the management and the tender political mercies of town boards, city councils and boards of supervisors.

"Bill 740-A would make it mandatory on county boards to provide systems of medical, dental and hospital care of 'all poor persons receiving relief,' thus fastening these expenditures on the county even though the need for them should disappear through economic recovery.

### Doesn't Hope for All

"Finally, if all else fails him, Mr. Biemiller has an ace in the hole. His Bill 662-A is a milder measure for the creation of non-profit associations to sell group hospitalization to subscribers, this time with at least some regard to the insurance laws of the state. But there is no standard of actuarial rates provided for, no standard of service set-up—nothing to assure that these people who paid their money would get the care they need.

"It is rumored that Mr. Biemiller hardly expects his whole program to pass, but that he does hope to get this group hospitalization bill through as an opening wedge.

"Finally, after Mr. Biemiller has declared in bill after bill what the public policy of the state is to be and how the legislature 'finds and declares' the need for the system which he proposes to set up, he has in 661-A a bill creating an interim committee of two senators and three assemblymen to find out in a two-year study whether the state needs it. Doctors are asking: 'Why not find out first?'

### Where Ideas Originate

"The background of these bills is almost as interesting as the bills themselves. There is said to be evidence that they did not spring full blown from the brow of Mr. Biemiller. This young man, who zoomed out of eastern universities to become a Socialist educational leader in Wisconsin, who ran for office and who is now going like a house afire in the legislature, is said to have been in touch with sociological foundations that are urging state medicine on this country.

"The Julius Rosenwald fund is interested in this field and has set aside a large sum for its promotion. A representative of this foundation is known to have been in Wisconsin. A Boston foundation is also said to be interested.

"This same group of bills, so it is reported, is to be introduced in the Minnesota legislature when it convenes in special session late this month.

"In other words, if possible, Wisconsin and Minnesota are to be made the 'guinea pigs' of rich foundations which have money to spend for the promotion of socialized medicine."

A proper procedure is to find out *where* Biemiller got his campaign fund?

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## THE A.M.A. ATLANTIC CITY MEETING

The A. M. A. meeting in Atlantic City in June was an epochal session. It brought together 9,764, with an additional 300 visiting physicians from Canada. It was the greatest assemblage of physicians in the history of medicine and a never before equalled wealth of material both to interest them and to instruct them. And it also gave them, in convention assembled, probably the greatest shock of their lives from Senator J. Hamilton Lewis of Illinois, who claimed he came as a messenger from the President of the United States and chucked into the very midst of this group of "grave and reverend seigniors" the sad social error of the vicious, socialistic foundling of State-Medicine-for-the-U. S., which malfeasance, of course, was the thumb-in-the-soup for the nation at large as well as for the convention.

But it takes a lot to discourage a recognized ethical M. D. In spite of the Washington unpleasantness, it was a grand old meeting. It was in many ways a regular old-fashioned camp meeting sort of a session, for there was enthusiasm everywhre! Enthusiasm for the advances made in science during the past year and enthusiasm over the record results American doctors under the present American plan are getting in the battle against sickness, disease and the sequelae of casualties. The growing menace and devastation of motor traffic accident—an ever increasing element in the "unpaid" accounts of doctors and hospitals as well as in the mutilation of human beings, of homes and generally of the economic structure—have led medical men the country over to take a hand in the efforts towards restriction of accident, and remoulding of traffic rules and legislation. This feature was one of the most attractive discussed at the session, for a logical method of combat appeared to be in process of formulation.

The house of delegates considered and adopted many and far-reaching resolutions. Several of the more important are as follows:

Approved the campaign against syphilis.

Stressed the value of preventive medicine.

Provided for the creation of a Council on Industrial Health.

Defined "free choice of physician" as applied to contract practice and so amended the principles of medical ethics.

Provided that appeals to the Judicial Council shall be perfected within six months.

Defined hospital care under group hospitalization contracts as to consist of room, bed, board, routine nursing care and routine drugs only, excluding all medical care.

Called attention to the advantages in not overcrowding hospitals for mental diseases.

Provided that the staffs of hospitals approved for intern training shall be members of their county medical societies.

Urged the formation of a national department of health under one head, in which would be consolidated all the health activities of the government.

Adopted resolution condemning the indiscriminate sale of the barbiturates.

Passed a resolution to provide for the selection of a meeting place three years beyond the time for the meeting.

Recommended that all county societies cooperate with rural organizations in providing good medical service to their respective communities.

Recommended that the A. M. A. establish a new Council on Industrial Health to consider the ever increasing phases of occupational diseases.

The report of the Committee on Contraception, or Birth Control, was adopted. This report placed the responsibility for the examination of products used in contraception upon the various councils. Recognizing the necessity for teaching the scientific aspects of both fertility and sterility, it further made the recommendation that physicians generally inform themselves as to their legal rights and responsibilities in re the prevention of conception and added the suggestion that all such practice be done in regularly licensed clinics and *under medical control.*

## THE NEW YORK RESOLUTION

Samuel J. Kopetsky presented the New York State resolution that was highly socialistic and revolutionary. The resolution was so drastic in nature that many members of the house of delegates were very much perturbed until the resolution was thoroughly emasculated, being finally disposed of in a manner satisfactory to all members of the house of delegates. The resolution embodied nearly all the economic problems confronting the medical profession today. The resolution went the full route in its recommendations for government subsidy.

The resolution stressed that the government is directly concerned with the health of all its citizens and that a national public health policy should be formulated immediately by the American Medical Association. Specifically the resolution proposed: (1) extension of public health services, federal, state and local; (2) provision for "adequate medical care for the medical indigent, the cost to be met from public funds"; (3) public funds for the support of medical education and medical investigation and research; (4) public funds for hospitals engaged in the care of the indigent sick; (5) "functional consolidation of all federal health and medical activities under a separate department."

The Reference Committee of the House of Delegates to which this resolution was referred reported as follows:

That, WHEREAS, the medical profession had always been willing to give its services to the indigent, it recognizes that there is a group of citizens not indigent and yet not competent financially to meet unusual medical costs and that the profession is willing to consider with other agencies ways and means of providing service and laboratory facilities for those not able to meet the full cost, but that the problem is local and state and not federal. The willingness of the profession to adjust its services is not in any sense of the word to be construed as an endorsement of compulsory or voluntary health insurance as a means of meeting the situation. The facilities of the American Medical Association are placed at the disposal of the government or any qualified agency in an effort to work out a solution of difficulties.

### SENATOR LEWIS' THREAT

Thursday, June 10, Senator Lewis appeared before the House of Delegates and offered the following warning (ILLINOIS MEDICAL JOURNAL, August, 1937):

That an amendment to the Social Security Act is going to pass the present Congress with adequate provision for the medical care of those who cannot afford to pay for it. He said that the President desired the medical profession's advice in formulating a federal medical program. He then made some rather startling statements: "The question for you doctors is not whether you like it or whether you don't. The question for you is what is to be done about it?" A little later he said: "I am compelled to tell you that Government is on its way of saying to you, 'Hold up here, Mr. Doctor. We are not asking you to do anything about a *patient*. . . . It is your creation. We recognize an instrument called *citizen* who is essential to the welfare of the Government'." And to those who would say "This is an invasion, it ought not to be adopted," Mr. Lewis replied, "It is the policy that seems to possess all mankind in his advances all over the world." The Senator believed the issue no longer escapable. Senator Lewis warned that there were even more drastic points of view in Washington, stating that there are those "who are shortly going to demand of you that there be a system of examinations and applications by the Federal Government upon every doctor in America to prove his right to be admitted under the federal law in addition to that which he is now enjoying under his local laws."

The Committee on Reapportionment in making their report, stated that the maximum membership of the House of Delegates according to the by-laws is 175. In order that this number shall not be increased, they recommended one delegate from state societies for each 825 members, or major fraction thereof. This would not increase the delegates from any society except from the New York State Society, which has made a large increase in membership the past year. Several states will lose one delegate. The Illinois delegation will not be affected. The recommendation of the committee was approved.

### THE PRESIDENT'S ADDRESS

In his talk to the house, the President, Dr. Heyd, stressed the major economic problems of the profession today. He discussed the increasing amount of free medical service being given each year in clinics, hospitals and infirmaries,

and stated that greater care should be taken in admitting these people for free service, so as to be sure that they were really entitled to such service. He approved of a plan to assure all people adequate medical care at a cost they can afford to pay. He discussed "adequate service," stating that much unnecessary work is being done, and that complete laboratory and X-ray services are not necessary in many cases now receiving them. He referred to a recent law in British Columbia which established a system of medical care at the expense of taxpayers; the 632 physicians in this territory voted on the proposition and since 613 were opposed to the plan, the Provincial Government promptly dropped the matter.

And here is something as fraternal as it was highly needed—a resolution was passed recommending the development of a distinguished service medal with citation to be presented each year to a physician who has rendered such service for the advancement of the art and science of medicine. Other new resolutions included recommending cooperation in securing drivers' licenses in various states so as to aid in the prevention of fatalities from motor accidents; encouragement of investigation of teaching of osteopathy by an unbiased, nonpartisan source; to the Social Security Board that examinations for blindness be carried out only by doctors of medicine, competent in diagnosis and treatment of diseases of the eye; encouragement in the use of motion pictures in public and in medical education and for reviews and censorship of films used for advertising promotion; to the Council on Medical Education and Hospitals for more extended inspection of hospitals.

The General Scientific Meetings commanded tremendous audiences, as did the motion picture clinic on syphilis. More than 300 papers were read in the scientific sessions. The symposiums on neuropsychiatry, papers on the use of sulfanilamide, and meetings of many of the sections attracted capacity audiences.

As in the Illinois meetings, the Scientific Exhibit has come to represent one of the most noteworthy of many extraordinary features of the annual session of the American Medical Association. A great many physicians spend their entire time during the week visiting these exhibits. The collections in this year's session were beyond any displays ever made in scientific value, appearance, attendance, quantity, arrangement and in every other detail.

The Technical Exposition merited the interest given to the Scientific Exposition, and what is more to the point—*got it!*

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## CAREFUL READINGS OF 1937 PROCEEDINGS OF A. M. A. HOUSE OF DELEGATES IS URGED UPON EVERY PHYSICIAN

Report of the proceedings of the convention of the American Medical Association for 1937 was published in June 12 and subsequent issues of Journal of the American Medical Association.

Careful reading of this well abridged epitome of what went on at Atlantic City is urged upon every physician in Illinois. It will be noted that at this convention as never before the question of the regimentation of the medical profession and its practitioners was not only the skeleton at the feast but a lusty beast seeking ravenously to devour all that is seemly in the theory and practice of the healing sciences.

The lay press reported generously upon the statements of Senator James Hamilton Lewis.

Unfortunately the amount of space given to the Senator did not hold the mirror up to his actual attitude towards that branch of communistic warfare against democracy that is expressed by the attempts to socialize medicine,

Once again let every doctor in Illinois be urged to spread the word of warning throughout the Union. Our nation stands at the stake, with the firebrands stacked ready to ignite by the insane impulses of socialistic scatterbrains. There is no room in the United States for another Russian bolshevistic imperialism, for that is the state to which communism leads inevitably.

Let the trend to socialize medicine be shifted to the socialization of the packing and clothing and other intustries and watch the change that will come over our public spirited men. At present the slogan of the destroyers is, "Medicine first; everything else next." It behooves every patriot and every American to beware of misguided temporizing with communism.

In addition to reading the Proceedings of the A. M. A. House of Delegates, it would be well to take down the old school books, riffle over the leaves of the old histories and re-read the immortal Patrick Henry. There was a man who

had ideas, the right ideas, the kind of ideas that helped to build a nation, not to wreck a world.

## POLIOMYELITIS INCREASES SHARPLY

ACCORDING TO STATE DEPARTMENT OF PUBLIC HEALTH, SPRINGFIELD, ILL.

Infantile paralysis, with 54 new cases reported last week, is now considerably more prevalent than at this date in any previous year since 1917, and the outlook is that the upward trend of incidence will continue for three or four weeks. Since mid-July the course of prevalence has run exactly true to form but on a higher level than usual. This fact, together with the history of poliomyelitis in Illinois, suggests that the peak of the current epidemic wave may be anticipated about the middle or toward the end of September.

Early diagnosis and early treatment under the direction of a competent physician are cardinal requirements for the best interests of the patients. No practicable method of prevention that may be recommended for general employment has been developed. Use of convalescents' serum, available free from the State Department of Public Health, in the treatment of patients early after the onset of illness is recommended. Experience in Illinois last year indicates that serum treatment when given soon enough is beneficial, strikingly so in not a few cases.

After the onset of paralysis, good orthopedic care is essential to optimal recovery. District health superintendents of the State Department of Public Health and physicians on the staff of the division for handicapped children of the State Department of Public Welfare have had special training in the diagnosis and methods of treating patients with poliomyelitis. Their services as consultants are available to practicing physicians.

Symptoms characteristic of poliomyelitis in the early stages of the disease include fever, rigidity of neck, pain on bending the head forward, rigidity of back, tremors of arms and legs, muscle tenderness and altered reflexes. Reflexes of biceps, triceps, knee and ankle jerks may be exaggerated or depressed.

Cases have been reported from all parts of the State although incidence has been more concentrated in Cook County and vicinity than elsewhere. The accumulated total of cases reported to date is 193 for this year against 89 in 1936. The distribution of cases reported last week was Cook County, 35; JoDaviess, 3; two each from DuPage, Kane, LaSalle and McLean; and one each from Jefferson, Macon, Marshall, St. Clair, Shelby, Stephenson, Will, Winnebago.

## INTERNATIONAL ASSEMBLY

The International Assembly of the Inter-State Postgraduate Medical Association of North America, under the presidency of Dr. John F. Erdmann of New York, will be held in the beautiful new public auditorium of St. Louis, Missouri, October 18, 19, 20, 21 and 22, with preassembly clinics on Saturday, October 16 and post-assembly clinics, Saturday, October 23 in the hospitals of St. Louis.

The aim of the program committee, with Dr. George Crile as chairman, is to provide for the medical profession of North America an intensive postgraduate course covering the various branches of medical science. The program has been carefully arranged to meet the demands of the general practitioner, as well as the specialist. Extreme care has been given in the selection of the contributors and the subjects of their contributions.

The St. Louis Medical Society will be host to the Assembly and has arranged an excellent list of committees who will function throughout the Assembly.

A tentative list of the distinguished teachers and clinicians who will take part on the program may be found on page 24 of the advertising section of this JOURNAL.

A most hearty invitation is extended to all members ofthe profession who are in good standing in their State or Provincial Societies to be present. A registration fee of 5.00 will admit each member to all the scientific and clinical sessions.

For further information, write Dr. W. B. Peck, Managing-Director, Freeport, Illinois.

### WE DOUBT IT

In the Twentieth Cenutry, war will be dead, the scaffold will be dead, hatred will be dead, frontier boundaries will be dead, dogmas will be dead; man will live. He will possess something higher than all these . . . a great country, the whole earth, and a great hope, the whole heaven.—Victor Hugo.

# MEDICAL ECONOMICS

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*Address all letters and communications to the Chairman.*

Any doubt as to the reliability of the promise made by Senator Lewis in his speech before the House of Delegates at the last annual meeting of the American Medical Association at Atlantic City last June, were completely dispelled last month when he introduced a resolution before the Senate beginning "To provide medical aid for the needy and the stricken with illness who are unable because of poverty to provide treatment and hospitalization; also to establish medical practitioners as civil officers of the National Government." Probably the majority of the medical profession have read this bill, for it has been discussed in every medical Journal printed since that time. If you have not, turn to page 436 of the J.A.M.A. of August 6 and read carefully. Surely the trend of the national government is definitely shown as far as the medical profession is concerned. The bill states that the doctor must answer all calls from the needy and render necessary care, under penalty of a fine of $1,000 or three months in jail or both. After the service has been rendered he can send a bill to the proper governmental agency who can pay it if all the rules and regulations have been conformed to. It is implied that the bill must be revised if it does not conform to all the rules and regulations agreed on by a governmental agency. Hospitals must admit all patients brought to them. Of course, the bill did not pass. It was not expected that it would. It was merely a trial balloon sent up inflated with hot air, generated by an expert. But you may be sure that the reactions of the medical profession and the American people will be and are being carefully watched by the alert boys down in Washington, who are making the plans and pushing the same with the aid of men like the Senator from Illinois. It is difficult to believe that the Senator believes in any such law. He is too old, too wise to think that you can accomplish real good to the people of this country by any such high handed methods. We prefer to believe that he did not write the law, but merely acted as agent in geting it before the Senate. Just who wrote it is of little moment. The important thing is why it was written and what is actually behind the bill. It does not take much thought to realize that this is merely another step in the process of REGIMENTATION, now being so carefully planned and carried on in Washington and at the same time so skillfully concealed by fine sounding phrases and soft words, that the rank and file of the American people are being lulled into a sense of false security, from which they will be awakened as rudely as the people of Europe have been the past few years. Unsuspecting as the medical profession is, it cannot fail to see that when this bill is passed, if it ever is, the days of the practice of medicine as a private business are over.

Meanwhile, with Congress adjourned and the quarreling members back home fixing their political fences and talking to their constituents, it is a fine time for the medical profession to do some real missionary work with both the public and the politicians. Even though there may be a special session of the Congress called for November to pass some of the legislation which fell by the wayside in the personal fuss which entertained the public and made enemies of old friends in the closing days of the last Congress, there is time for something to be done. If by chance, the time is extended to the first of the year, so much the better. But there is much to be done if the medical profession is to successfully oppose this bill. The officers of the State Society cannot do all of it, although they should and probably will give unsparingly of their time. The rank and file of the medical profession must help and to be able to help, they must read up on the bill and know why it is unfair and will not work. Then and only then, will they be in position to tell the public and the Senators and Representatives why it is not a good thing for the people of the United States. What better

point can we make than to point with pride at the mortality and morbidity rate of the United States in comparison with any country of Europe and particularly those where they have been enduring State Medicine for from twenty to forty years. Just sitting at home and condemning the Federal Government will not accomplish a single thing. Neither will a defeatist attitude that nothing can be done about it, for reform of a similar nature is in the air and opposition will be of no avail. Surely, the United States is not obliged to make all the same mistakes of Europe. It is our job to point out some of these mistakes and show how much superior our method of practicing medicine is over that of Europe.

The lay press has a kindly feeling to the medical profession at this time. We can make use of this feeling if we are wise and do not impose on them. Every medical Journal coming out has articles and editorials on the subject, in every one of which the plan has been condemned. Please read them and do your bit in understanding the problem and explaining it to the general public.

Probably all of this problem will be discussed at the meeting of the Council on August 30 and there may be some report of the action taken, by either the Secretary or the Editor of the ILLINOIS MEDICAL JOURNAL. The Medical Economics Committee will hold a meeting on the 29th, and we hope to have some definite report to make next month.

An article by the President of the Illinois Medical Society, Dr. R. K. Packard, is included in this month's column. Please read it, for Dr. Packard, in addition to being a deep thinker, has the ability to express his thoughts to others in a way that is exceptional. He has given considerable time to this article and has some good advice for all of us in the medical profession and for the good of the medical profession itself.

E. S. HAMILTON, M. D.,
Cairman Committee on Medical Economics.

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## "THE WAKE" ALWAYS CARRIED HELP! HELP! IN ITS ARTICLES

The Officers of the State Society desire your help, your suggestions, your views on problems dealing with the physician's role in the practice of medicine and the role of the public as recipients of medical care. Constructive criticism is always enjoyed, for out of that comes real progress. Among the seven thousand physicians in this state, all have given thought to their own problems in their community, and perhaps they have formulated what they consider a remedy for those problems that affect them and their patients.

I frequently hear doctors making suggestions as to what they think ought to be done. Sometimes they let it pass with the remark that the Society is not doing what it ought to for the doctors and the public. When you ask them to submit in some definite form their recommendations for the good of the profession and the public, they sometimes reply, that's your business, or better put, the business of the Officers of the Society. The Officers appreciate their responsibility and I am sure endeavor to meet, as well as they know how, the many problems now confronting them, but your Officers are also mindful of the fact that they have many outstanding men in all of their communities that have excellent minds that could be of great assistance to the Officers if they would share more fully their responsibilities.

If ever, at the present time, we need a united front, not so much just for our own protection, but for the protection of the people who receive medical care. Aside from the whole realm of medical practice we need a united front in this rapidly changing State. Co-ordination must come into our national life; bureaucracy cannot solve our intricate problems. It cannot solve the problems of the doctor, nor of the small business man, nor of the management of large industry.

The writer has repeatedly said, "that we have problems in the practice of medicine." The small individual has problems in his own business and the large industries that depend on management have multiplied problems.

Employees have their problems, multiple in number, and their sensible and profitable solution must come from within and not from without.

The practice of medicine occupies a position much clearer in concept because the rendering of good medical service has never turned backward. Its march has always, and particularly of late, been to an increasing efficiency. Why, with this record of achievement, any one could

ask for a radical change seems unanswerable. It seems particularly unanswerable when experiments over a period of years in other countries have failed.

The medical economics column of this JOURNAL was established so that the doctors of this State might express themselves regarding our problems. There should be a larger number of contributions to this column, and particularly constructive articles along the lines of rendering better medical service.

We should constantly fight trends and legislation that will ultimately be injurious to public and private welfare, and our strongest weapon of attack will always be a constantly increasing valuable service to the public. Increasing value of our service to the public may come from several sources.

1. Co-operation with the health authorities in the prevention of the spread of disease.

2. Co-operation with the hospitals for better post graduate courses and better intern training.

3. Co-operation with your county medical society both from the standpoint of education and economics.

4. Co-operation with the educational committee of the State Society to fill speaking engagements for both scientific and lay educational programs.

5. Co-operation with your legislative committee to the end that laws do not pass that are inimical to public welfare.

6. Co-operation with your colleagues for a freer consultation in undiagnosed and complicated cases.

7. The use of all the available knowledge in diagnosis and treatment of diseases in your private practice.

8. Co-operation in the decrease of medical costs by not doing useless laboratory and x-ray work just because the public have been somewhat educated to "Getting the Works."

9. Co-operation with plans for experimental purposes in attempting to find better medical care for the indigent and very low income groups.

10. Co-operation between your library and yourself.

Dr. R. K. Packard.

## Correspondence

### EXAMINATION FOR HEALTH OFFICERS OF CHAMPAIGN-URBANA AND EAST ST. LOUIS HEALTH DISTRICTS

Notice is hereby given that an examination will be held at Springfield, Illinois for the purpose of selecting a Health Officer for the Champaign-Urbana Health District and the East St. Louis Health District.

Application blanks may be secured by writing to the Director, Illinois Department of Health, Springfield, Illinois. All applications must be received by September 15, 1937. Acceptable applicants will be informed by mail as to the specific date of the examination.

The determination of qualification for the positions will be based on the standards as appearing in Appendix A, Supplement No. 126, The Public Health Program under title VI of the Social Security Act as published by the U. S. Government printing office, Washington, 1937.

Frank J Jirka, M. D.,
Director, Illinois Department of Health.

### TELEGRAM OF PROTEST SENT SENATOR JAMES HAMILTON LEWIS

The following telegram was sent to Senator James Hamilton Lewis in opposition to the proposal that he introduced in the United States Senate, which would result in the regimentation of physicians throughout the United States and penalize any doctor who refused to give aid to an indigent person by a fine not to exceed $1,000 and imprisonment of not more than three months:

"Senator James Hamilton Lewis
Springfield Illinois July 31 1937
Washington D C
A canvass of opinion shows Illinois medical profession strongly opposed your proposal of federalizing physicians Stop The millions misled by Townsend pension scheme and Huey Long share wealth Will O Wisp illustrate the confusion and disappointment that would result among people it seeks to help Stop Impoverished now get as good medical care as would be practical under any scheme and middle classes would not be covered Stop Abuse of system would be monumental without burdensome machinery of

enforcement and that would create expense organization susceptible of inimical political control Stop Good doctors would be overwhelmed under compulsory penalty provision while voluntary acceptance of patients by doctors would relegate treatment of beneficiaries to lowest rank physicians Stop Human nature factor makes impossible satisfactory functioning of a nationalized medical care system Stop Federal treasury is regarded as everlasting fountain of wealth which can be tapped without reservation Stop This attitude eliminates economical administration Stop It is amazing how many complaints a man will get when medical service is free Stop Your proposal is contrary to the best public interest, would greatly reduce quality of medical care would violate principle of home rule, become a gigantic financial burden and would result in no public advantage Stop Earnestly urge reconsideration of this proposal

J R Neal M D Chairman
Legislative Committee"

In addition to Senator Lewis, this information was sent to Senator Dieterich of Illinois and to each of the Congressmen from this State; also to the officers of the Illinois State Medical Society, the officers of each County Society in the State of Illinois, and to many physicians throughout the State, and in addition to each President and Secretary of the State Societies throughout the nation and to the officers of the American Medical Association.

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## EDUCATIONAL COMMITTEE

*Report for June, July and August,* 1937

RADIO:

Forty-seven programs were given during the summer. Dozens of talks given in previous broadcasts have been rewritten into dialogues or interviews between the announcers of the stations and doctors. These have been very popular and will be continued from time to time.

The Committee is planning to get out a weekly or monthly sheet showing the broadcasts to be given over a period. These announcements will be sent to presidents of various lay organizations and others who may be interested in giving publicity to this type of health education material.

POSTGRADUATE COURSES IN OBSTETRICS AND PEDIATRICS:

Many conferences and meetings have been held to make plans for the postgraduate courses to be offered in Illinois. Mistakes of last spring are being corrected and it is felt that the courses to be offered this fall are outstanding. Specialists in the fields of obstetrics and pediatrics have been selected representing all sections of the state to give these courses. New subjects have been selected. Excellent slides have been made. It is expected that many counties will wish to take advantage of the material. Concrete help will be given secretaries in promoting attendance and publicity through the office of the Educational Committee.

SCIENTIFIC SERVICE COMMITTEE.

Speakers were scheduled for the following summer meetings:

Aurora Medical Society—Dr. Frank P. Hammond, "Medical Ethics."

Effingham County—Dr. I. H. Neece, "Venereal Disease Campaign."

Marion County—Dr. Ben Morgan, "General and Local Anesthetics."

Marion County—D. C. Wray (Attorney), "Legal Aspects of Medicine."

Monroe County—Dr. J. J. Donahue, "Pediatrics."

Whiteside County—Dr. R. K. Packard, "The Practice of Medicine, Then and Now."

Hancock County—Dr. S. M. Feinberg, "Summer Allergy."

A new list of speakers and subjects for county medical society programs has been compiled. The subjects cover all fields of medicine and the speakers represent all sections of the state. This booklet will soon be released to all officers of county societies and should offer some excellent suggestions for scientific programs.

DISPLAY WINDOWS:

The window at Marshall Field & Co. has carried exhibits on:

"Spring Tonics."
"History of Medicine in Chicago."
"Hay Fever."

The windows have been excellent and an effort has been made to have them in keeping with topics of current interest.

PRESS SERVICE:

Editorial style articles have been written as follows:

Why Organized Medicine Opposes Insurance for Ailments.
Make It Safe and Sane.
Summers Past and Present.
Typhoid Fever.
Preparation for Marriage.
Shall He Study Medicine?
Will Your Child Be Ready?
Prevention of Diabetes.
Hay Fever.
The Human Body and Its Protection.
Your Child Won't Eat?
A Change in Outlook.
Dangers in Drugs.
The Gall Bladder.
The Blood Count.
What Poison Are You Taking?
How Tired Are You?

1,105 copies of the above articles went to Illinois newspapers.

1,062 articles to newspapers not included in the above.

1,884 health articles were sent to downstate libraries, home advisers, health chairmen of clubs, WPA workers.

576 health articles to Chicago libraries.

60 articles released in the monthly press service.

231 articles to Chicago newspapers.

Special material on the history of medicine in Kane County was secured for the Aurora Beacon News in connection with their centennial edition.

Special Publicity for County Meetings:

33 newspaper releases for Whiteside County.

77 newspaper releases for Hancock County.

SERVICE TO COUNTY MEDICAL SOCIETIES:

214 notices sent out for Henry County.

126 notices for Whiteside County.

63 notices for Randolph County.

94 notices for Effingham County.

SPEAKERS' BUREAU:

Few clubs hold meetings during the summer. The few requests which came in from men's service organizations were for talks on the problems of socialized medicine.

Many requests have come in for speakers during the coming months and these are being taken care of. The Committee is hoping that it will be possible for clubs to pay transportation expenses of all speakers. In that event, it hopes to offer a small honorarium to doctors who give their time for this type of educational work.

The Committee is planning to secure suitable material for distribution at lay meetings addressed by physicians. This material will be secured from the American Medical Association, the State Department of Public Health and ohter recognized sources.

Respectfully submitted,

JEAN MCARTHUR,
Secretary.

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## QUINCY (ILLINOIS) MEETING OF MISSISSIPPI VALLEY MEDICAL SOCIETY

The third annual meeting of the Mississippi Valley Medical Society will be held at Quincy, Illinois, Sept. 29, 30, Oct. 1. A most ambitious program has been arranged consisting of 48 teachers and clinicians who will give over 60 lectures and demonstrations in the three day intensive session. The first day will be an All St. Louis program with 18 clinicians on the program; on the second day there will be groups from Rochester and Chicago; on the third day the speakers will come from a wide territory. An innovation this year will be two short courses of instruction (four hours each)—one on "Surgery of the Neck" by Dr. Lindon Seed, Associate Professor of Surgery, University of Illinois College of Medicine and another "Interpretation of Clinical Laboratory Findings" by Dr. M. Pinson Neal, Prof. of Pathology, University of Missouri School of Medicine. At the annual banquet to be held on Sept. 30th, the speakers will consist of Dr. R. K. Packard, President, Illinois State Medical Society; Dr. D. S. Conley, President, Missouri State Medical Society and Dean ot the University of Missouri School of Medicine; Dr. E. M. Myers, President of the Iowa State Medical Society; and Rev. A. M. Schwitalla, Ph.D., Dean of St. Louis University School of Medicine. There will be large technical and scientific exhibits. A complimentary stag supper will be given on Sept. 29. The meeting is open to all ethical Physicians. A detailed program may be obtained from Dr. Harold Swanberg, Secretary, 209-224 W.C.U. Building, Quincy, Illinois.

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45TH ANNUAL CONVENTION

## ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES

*Ambassador Hotel, Los Angeles*

First General Meeting—*Thursday, October* 14.

Opening Session: 10:15 A. M.

Invocation.

Address of Welcome.

Response.

President's address, Rear Adm. P. S. Rossiter, Surgeon General of the Navy.

FIRST SCIENTIFIC MEETING

*Thursday, October* 14, 1:30 *P. M.*

1. Capt. George A. Cottle, M. C., U. S. Navy, "Fleet Medicine." Discussion to be opened by Capt. Lester L. Pratt, M. C., U. S. Navy.

2. Maj. J. S. Chase, M. C., U. S. Army Ret., "Eyes in Aviation."

3. Lt. Col. I. H. Jones, Med. Res. U. S. Army, "Ears in Aviation." (Motion picture showing research).

4. Col. Charles Decker, U. S. Army (D. E. O.) Ret., "The Training of Medical Officers in a Major War Emergency."

SECOND SCIENTIFIC MEETING

*Friday, October* 15, 10:00 *A. M.*

1. Capt. Leroy Lowman, Med. Res. U. S. Army. (Advisory Committee Warm Springs Foundation.) "Physiotherapy in the Next War." (Slides.) Discussion to be opened by 1st Lt. Harold Dewey Barnard, Med. Res. U. S. Army.

2. Lt. Comdr. Albert G. Bower, MC-V (S) U. S. N. R., "Modern Typhoid Treatment." Discussion to be opened by Roy Fisk, M. D.

3. Capt. Lucius Johnson, M. C., U. S. Navy, "Hospital Ships in the World War: Lessons to Be Learned from Them." (Slides) Discussion to be opened by Capt. George Cottle, M. C., U. S. Navy.

4. Lt. Albert Wineland, MC-V (S) U. S. N. R., "Anesthesia in Shock." Discussion to be opened by Eldon Tice, M. D.

THIRD SCIENTIFIC MEETING

*Friday, October* 15, 1:30 *P. M.*

1. Lt. A. R. Behnke, M. C., U. S. Navy. "Submarine Medicine." (Slides.)

2. Chairman's address, Lt. Comdr. Howard L. Updegraff MC-V (S) U. S. N. R., "Emergency Plastic Surgery." (Motion picture.)

3. Comdr. C. V. Rault, D. C., U. S. Navy, "The Blood Sedimentation Rate in Dental Infections." (Slides.)

4. Comdr. Albert Soiland, MC-V (S) U. S. N. R. Ret., "The Medical Specialists Units, U. S. N. R."

SECOND GENERAL MEETING

*Saturday, October* 16

Opening session, 10:00 A. M.

Guest Speaker, Col. Howard Naffziger, Med. Res. U. S. Army, "Surgical Treatment of Low Back Pain." Slides.)

## FIFTEENTH ANNUAL MEETING OF THE ACADEMY OF PHYSICAL MEDICINE

*Philadelphia, October* 19, 20, 21

The Fifteenth Annual Meeting of the Academy of Physical Medicine will be held at the Hotel Walton, Philadelphia, October 19, 20, 21, 1937.

The Academy, which is international in scope, will present a scientific program based on reports of the most recent research and practice of the various specialties. In addition to the lectures, demonstration clinics will be held at the Hospitals of the University of Pennsylvania, Jefferson Medical College, and Temple University.

A copy of the program may be had by addressing: William D. McFee, M. D., Chairman, 41 Bay State Road, Boston, Mass.

## THE FOURTH INTERNATIONAL LEPROSY CONFERENCE

Arrangements are being made to hold the fourth International Leprosy Conference in Cairo beginning March 21, 1938. This conference is being organized by the International Leprosy Association, and this will be the first International Conference to be arranged by this association since its inauguration in 1931. Three previous conferences of this nature have been held—at Berlin in 1897, at Bergen in 1909, and at Strassbourg in 1923.

The Egyptian Government is inviting all countries concerned to send official delegates. In addition to these, doctors and others interested in the subject are invited to be present. Full information can be obtained from the Secretary of the International Leprosy Association, 131 Baker Street, London, W. 1.

## INTERNATIONAL MEDICAL ASSEMBLY INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

*October* 18, 19, 20, 21, 22, 1937

Pre-assembly Clinics, October 16

Post-assembly Clinics, October 23

St. Louis Hospitals

ST. LOUIS, MISSOURI

*Monday, October* 18

8:00 A. M.

Diagnostic Clinic: "Cosmetic Results in the Treatment of Cancerous Skin Lesions." Dr. Joseph Eller, Professor of Clinical Dermatology and Syphilology, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Diagnostic Clinic: "Hypertensive Heart Disease, Manifestations, Diagnosis, Treatment." Dr. Fred M. Smith, Professor of Theory and Practice of Medicine, State University of Iowa College of Medicine, Iowa City, Iowa.

Diagnostic Clinic: "Deficiency Diseases." Dr. Russell L. Haden, Chief of Medical Division, Cleveland Clinic, Cleveland, Ohio.

*Intermission to Review Exhibits*

Diagnostic Clinic: "The Symptoms and Treatment of Injuries of the Spinal Cord." Dr. Loyal Davis, Professor of Surgery, Northwestern University School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Types of Obesity and Their Treatment." Dr. Reginald Fitz, Associate Professor of Medicine, Boston, University Medical School, Boston, Mass.

*Noon Intermission*

1:00 P. M.

Diagnostic Clinic: "Surgical Treatment of Peptic Ulcer." Dr. Donald C. Balfour, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Ulcerative Colitis and Its Surgical Management." Dr. Richard B. Cattell, Lahey Clinic, Boston, Mass.

Address: "The Roentgent Treatment of Infections." Dr. Frederick M. Hodges, Professor of Clinical Radiology, Medical College of Virginia, Richmond, Virginia.

*Intermission to Review Exhibits*

Address: "Meningitis Secondary to Disease of the Bones of the Skull." Dr. Wallis P. Eagleton, Newark, New Jersey.

Address: "The Treatment of Urinary Infections in Infants and Children." Dr. John R. Caulk, Professor of Clinical Genito-Urinary Surgery, Washington University School of Medicine, St. Louis, Mo.

Address: "Prenatal Care." Dr. Otto H. Schwarz, Professor of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, Mo.

Address: "Granulomatous Lesions of the Intestines." Dr. Claude F. Dixon, Assistant Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

*Dinner Intermission*

7:00 P. M.

Address: "Recent Advances in the Field of Abdominal Surgery." Mr. W. Hugh Cowie Romanis, F. R. C. S., Surgeon to St. Thomas Hospital, London, England.

Address: "The Influence of Drugs upon the Physiology of the Failing Heart." Dr. Maurice B. Visscher, Professor of Physiology and Head of the Department, University of Minnesota Medical School, Minneapolis, Minn.

Address: "The Mechanism and Treatment of Congestive Heart Failure." Dr. Tinsley R. Harrison, Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn.

Address: "The Diagnostic Significance of Abdominal Pain." Dr. Frederick J. Kalteyer, Clinical Professor

of Medicine, Jefferson Medical College, Philadelphia, Pa.

Address: "Carcinoma of the Stomach." Dr. Waltman Walters, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minn.

Address: "Chronic Prostatitis." Dr. Cyrus E. Burford, Professor of Urology, St. Louis University School of Medicine, St. Louis, Mo.

*Tuesday, October* 19

8:00 A. M.

Diagnostic Clinic: "The Effect of General Infection on the Nervous System of Children." Dr. Bronson Crothers, Assistant Professor of Pediatrics, Harvard University Medical School, Boston, Mass.

Diagnostic Clinic: "Spastic Paralyses." Dr. Alan deForest Smith, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Diagnostic Clinic: (Subject to be supplied.) Dr. Dean D. Lewis, Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

*Intermission to Review Exhibits*

Diagnostic Clinic: "Pitfalls in the Diagnosis of Acute Abdominal Conditions." Dr. Alton Ochsner, Professor of Surgery, Tulane University of Louisiana School of Medicine, New Orleans, La.

Diagnostic Clinic: "Various Types of Edema and Their Treatment." Dr. David P. Barr, Busch Professor of Medicine, Washington University School of Medicine, St. Louis, Mo.

*Noon Intermission*

1:00 P. M.

Diagnostic Clinic: "The Management of Compound Fractures of the Extremities." Dr. John J. Moorhead, Professor of Clinical Surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Address: "Migraine." Dr. Thomas Cecil Hunt, St. Mary's Hospital, London, England.

Address: "Cicatrizing Enteritis—A Neglected Clinical Entity." Dr. Elliott C. Cutler, Moseley Professor of Surgery, Harvard University Medical School, Boston, Mass.

*Intermission to Review Exhibits*

Address: "The Problem of Ocular Tuberculosis." The Joseph Schneider Foundation Presentation. Dr. Alan C. Woods, Acting Professor of Ophthalmology, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "Combined Abdomino-perineal Resection for Carcinoma of the Rectum." Dr. Thomas B. Jones, Cleveland Clinic, Cleveland, Ohio.

Address: "Early Diagnosis and Treatment of Cancer of the Cervix." Dr. John R. Fraser, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.

Address: (Subject to be assigned.) Dr. Marion L. Klinefelter, St. Louis, Missouri.

*Dinner Intermission*

7:00 P. M.

Address: "Growth Disturbances of the Pelvis and Femur Resulting from Diseases of the Hip Joint." Dr. Dallas B. Phemister, Professor of Surgery, University of Illinois College of Medicine, Chicago, Illinois.

Address: "The Post Hoc Ergo Propter Hoc Fallacy in Medicine." Dr. Robert D. Rudolf, Professor Emeritus of Therapeutics, University of Toronto Faculty of Medicine, Toronto, Canada.

Address: "Allergy as Related to the Otolaryngologist." Dr. Harold G. Tobey, Boston, Massachusetts.

Address: "Newer Methods in the Medical Treatment of Peptic Ulcer." Dr. Horace W. Soper, St. Louis, Missouri.

Address: "Subdural Hematoma." Dr. Eric Oldberg, Professor of Neurology and Neurological Surgery, University of Illinois College of Medicine, Chicago, Ill.

Address: "Toxemias of Pregnancy." Dr. Nicholson J. Eastman, Professor of Obstetrics, Johns Hopkins University School of Medicine, Baltimore, Md.

*Wednesday, October* 20

8:00 A. M.

Diagnostic Clinic: "Hay Fever." Dr. J. Harvey Black, Professor of Preventive Medicine, Baylor University College of Medicine, Dallas, Texas.

Diagnostic Clinic: "Newer Methods of Vascular Surgery." Dr. Wayne Babcock, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia, Pa.

Diagnostic Clinic: "Bronchiectasis and Certain Phases of Tuberculosis." Dr. Charles R. Austrian, Associate Professor of Medicine, Johns Hopkins University School of Medicine, Baltimore, Md.

*Intermission to Review Exhibits*

Diagnostic Clinic: "Dyspepsia, Organic Reflex and Functional." Dr. Walter C. Alvarez, Professor of Medicine, University of Minnesota, The Mayo Foundation, Rochester, Minn.

Diagnostic Clinc: "Syphilis of the Central Nervous System." Dr. Leon H. Cornwall, Associate Professor of Neurology, Columbia University College of Physicians and Surgeons, New York, N. Y.

*Noon Intermission*

1:00 P. M.

Diagnostic Clinic: "Abdominal Pain." Dr. Irvin Abell, Clinical Professor of Surgery, University of Louisville School of Medicine, Louisville, Ky.

Address: "Drugs in the Treatment of Heart Disease." Dr. Robert L. Levy, Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, New York, N. Y.

Address: "Diagnosis and Treatment of Brain Abscess." Dr. Walter E. Dandy, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore, Md.

*Intermission to Review Exhibits*

Address: "X-ray Treatment of the Pituitary Gland." Dr. Merrill C. Sosman, Assistant Professor of Roent-

genology, Harvard University Medical School, Boston, Mass.

Address: "Water Balance in Surgical Patients with Special Reference to Pre- and Post-Operative Management." Dr. Frederick P. Coller, Professor of Surgery, University of Michigan Medical School, Ann Arbor, Mich.

Address: "Anxiety States in General Practice." Dr. William J. Kerr, Professor of Medicine, University of California Medical School, San Francisco, California.

*Assembly Dinner*

For members of the profession, their ladies and friends.

Informal

7:00 P. M.

Dr. John F. Erdmann, Master of Ceremonies.

Addresses by eminent members of the profession and other distinguished citizens of the world.

*Thursday, October 21*

8:00 A. M.

Diagnostic Clinic: "Cirrhosis of the Liver." Dr. Charles A. Elliott, Professor of Medicine, Northwestern University School of Medicine, Chicago, Ill.

Diagnostic Clinic: "Factors to be Considered in the Diagnosis of Diseases of the Genito-Urinary Tract." Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Nephritis." Dr. Jonathan C. Meakins, Professor of Medicine, McGill University Faculty of Medicine, Montreal, Canada.

*Intermission to Review Exhibits*

Diagnostic Clinic: "Post-Operative Fistulae with Special Reference to the Gall-Bladder." Dr. John F. Erdmann, Attending Surgeon, New York Postgraduate Hospital and Medical School, Columbia University, New York, N. Y., President, Inter-State Post Graduate Medical Association.

Diagnostic Clinic: "The Relation of Diabetes to Arteriosclerosis." Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard University Medical School, Boston, Mass.

*Noon Intermission*

1:00 P. M.

Address: "A New Approach to the Treatment of Peptic Ulcer." Mr. Wilson Hey, F. R. C. S., Surgeon, Manchester Royal Infirmary, Manchester, England.

Address: "The Adherent Posterior Duodenal Ulcer." Dr. J. William Hinton, Associate Professor of Clinical Surgery, New York Postgraduate Medical School, Columbia University, New York, N. Y.

Address: "The Prevention and Treatment of the Exanthemata." Dr. John A. Toomey, Associate Professor of Pediatrics, Western Reserve University School of Medicine, Cleveland, Ohio.

*Intermission to Review Exhibits*

Address: "Indication for Hysterectomy and Radium in Fibroid Tumors of the Uterus Based on One Thousand and Twenty-five Cases." Dr. William D. Haggard, Professor of Surgery, Vanderbilt University School of Medicine, Nashville, Tenn.

Address: "Endocarditis." Dr. Ralph A. Kinsella, Professor of Internal Medicine, St. Louis University School of Medicine, St. Louis, Mo.

Address: "Recent Advances in Hormone Therapy as Applied to Gynecological Problems." Dr. Emil Novak, Associate in Gynecology, Johns Hopkins University School of Medicine; Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore, Md.

*Dinner Intermission*

7:00 P. M.

Address: "The Surgical Treatment of Diverticulitis." Dr. Fred W. Rankin, Lexington, Kentucky.

Address: "Diagnosis and Treatment of Displacements of the Uterus." Dr. William H. Vogt, Director of the Department of Gynecology and Obstetrics, St. Louis University School of Medicine, St. Louis, Mo.

Address: "The Relation of the Development of the Child to the Endocrine System." Dr. Charles R. Stockard, Professor of Anatomy, Cornell University Medical College, New York, N. Y.

Address: "Indications for Exploratory Laparotomy." Dr. William T. Coughlin, Professor of Surgery, St. Louis University School of Medicine, St. Louis, Mo.

Address: "Tumors of the Kidney." Dr. Herman L. Kretschmer, Clinical Professor of Surgery, Rush Medical College, University of Chicago, Chicago, Ill.

*Friday, October 22*

8:00 A. M.

Diagnostic Clinic: "Surgical Lesions of the Common and Hepatic Ducts." Dr. Frank H. Lahey, Director of Surgery, Lahey Clinic; Surgeon to the New England Baptist Hospital and the New England Deaconess Hospital, Boston, Mass.

Diagnostic Clinic: "The Diagnosis and Management of Cardiac Arrhythmias." Dr. Roy W. Scott, Professor of Clinical Medicine, Western Reserve University School of Medicine, Cleveland, Ohio.

Diagnostic Clinic: "Chest Surgery." Dr. Evarts A. Graham, Bixby Professor of Surgery, Washington University School of Medicine, St. Louis, Mo.

*Intermission to Review Exhibits*

Diagnostic Clinic: "The Medical Treatment of Arthritis." Dr. Cyrus C. Sturgis, Professor of Internal Medicine, University of Michigan Medical School, Ann Arbor, Mich.

Diagnostic Clinic: "Diagnosis and Management of Diseases of the Thyroid Gland." Dr. George Crile, Cleveland Clinic, Cleveland, Ohio.

*Noon Intermission*

1:00 P. M.

Address: "The Surgical Treatment of Arthritis." Dr. Philip D. Wilson, Clinical Professor of Orthopedic Surgery, Columbia University College of Physicians and Surgeons, New York, N. Y.

Address: "Diet of Infants." Dr. Charles Hendee Smith, Professor of Pediatrics, University and Bellevue Hospital Medical College, New York, N. Y.

Address: "The Relation of the Pituitary, Thyroid, Adrenals, Liver, and Pancreas to Hyperinsulinism and Spontaneous Hypoglycemia." Dr. Seale Harris, Pro-

fessor Emeritus of Medicine, University of Alabama School of Medicine, Birmingham, Ala.

Address: "Relief of Intractable Pains by Subarachnoid Alcohol Injections, Nerve Blocks, Root Sections, and Chorodotomy." Dr. W. McK. Craig, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Foundation, Rochester, Minn. and Dr. Alfred W. Adson, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine; Senior Neurosurgeon of Mayo Clinic, Rochester, Minn.

*Intermission to Review Exhibits*

Address: "Diagnosis and Treatment of Pneumonia." Dr. Russell L. Cecil, Professor of Internal Medicine, New York Polyclinic Medical School and Hospital, New York, N. Y.

Address: "The Significance of Hoarseness and Local Discomfort in Laryngeal Disease." Dr. Gabriel Tucker, Professor of Clinical Bronchoscopy and Esophagoscopy, University of Pennsylvania School of Medicine, and Professor of Bronchoscopy and Laryngeal Surgery, Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa.

Address: "The Surgery of Hermaphroditism and Associated Adrenal Diseases." Dr. Hugh H. Young, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore, Md.

Address: "The Menace of Post-Operative Adhesions." Dr. Fred W. Bailey, St. Louis, Missouri.

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## MEDICO-MILITARY INACTIVE DUTY TRAINING

1. The ninth annual training course for Medical Department reservists of the Army and Navy will be held at the Mayo Foundation, Rochester, Minnesota, October 3 to 16, 1937.

2. This training course was first inaugurated by the Seventh Corps Area at the request of the Mayo Foundation to give training in military medicine to the young medical men connected with the foundation. Other reserve officers requested permission to enroll and to take advantage of the opportunity to attend the clinical presentations during the morning hours. Such permission was granted and attendance has become so increasingly popular that it is now necessary to limit enrollment.

3. The program will follow the plan of past years. The morning hours will be devoted entirely to professional work in special clinics and study groups. Officers in attendance may select the course they wish to follow from the wide variety of presentations offered. The afternoon and evening will be devoted to a medico-military program under the direction of the Surgeon of the Seventh Corps Area (Army) and the Surgeon of the Ninth Naval District (Navy).

4. This training is on an inactive duty status and is without expense to the government. Enrollment is open to all Army and Navy reservists of the Medical Departments in good standing. Applications should be submitted to the Surgeon of the Seventh Corps Area, Omaha, Nebraska, or to the Surgeon of the Ninth Naval District, Great Lakes, Illinois. Enrollment is limited to two hundred.

5. The Surgeons General of the Army and Navy have signified that they will attend and it is believed that the Surgeon General of the Public Health Service will also appear on the program.

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## WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

*Tuesday Noon, May* 18, 1937

*Luncheon.*—Creve Coeur Club, Mrs. Frank P. Hammond, President, presiding.

Mrs. Hammond opened the Luncheon Session by introducing members of her Board to the group. She next introduced the President-Elect, Mrs. H. B. Henkel, and the Peoria hostess, Mrs. Milo T. Easton and her Committee. Mrs. Robert Fitzgerald, our honored guest speaker, and National President, from Wauwatosa, Wisconsin, and our National Treasurer, Mrs. Eben J. Carey of Milwaukee, Wisconsin, who traveled with her, were introduced by Mrs. Hammond.

Mrs. Fitzgerald spoke very inspiringly on the privilege of membership in an auxiliary which numbers 16,000 and which showed an increase of 1,000 this year. She also stressed our special obligation in belonging by giving the laity authentic information on health matters. Mrs. Fitzgerald related some of the many interesting experiences she has had visiting auxiliaries throughout the year, this being her 16th state to date. In closing she expressed appreciation for our splendid work in *Hygeia* for the year, and thanked us for our hospitality. Mrs. Carey also spoke to us briefly and thanked us for her enjoyable stay in Peoria.

Mrs. F. P. Hammond expressed our thanks to our two honored guests and our Peoria hostesses for the lovely luncheon, especially to Mrs. Milo T. Easton and her Committee.

*Tuesday Afternoon, May* 18, 1937

Tenth Annual General Session for all Physicians' Wives, Jefferson Hotel, Mrs. F. P. Hammond presiding.

Invocation, Rev. William Atkinson Young.

Address of Welcome, Mrs. Milo T. Easton.

Response, Mrs. John A. Wolfer.

(Mrs. Harry J. Dooley unable to appear as scheduled for response, Mrs. Wolfer very graciously substituted.)

Mrs. Hammond, before opening the business session, introduced the Parliamentarian, Mrs. Morrow. Mrs. Hammond introduced Mrs. J. P. Simonds as Chairman of Resolutions, and who will receive any recommendations from body at large.

Mrs. Hammond introduced Mrs. Robert Fitzgerald, National President, and Mrs. Eben J. Carey, National Treasurer, to the assembly for the benefit of those who did not attend the luncheon.

The minutes of the last Annual Session are not read as they were approved at last convention Post Board Meeting.

Roll Call: The following members of the Board

were present: Mrs. F. P. Hammond, Chicago; Mrs. H. B. Henkel, Springfield; Mrs. E. J. Berkheiser, Chicago; Mrs. I. L. Foulon, East St. Louis; Mrs. William Raim, Chicago; Mrs. H. M. Camp, Monmouth, Recording Secretary, pro-tem.

Councilors: Mrs. R. E. Davies, Spring Valley; Mrs. Lucius Cole, River Forest; Mrs. F. E. Bollaert, East Moline; Mrs. E. F. Allen, Arcola.

Chairmen of Standing Committees: Mrs. H. B. Henkel, Springfield; Mrs. V. M. Seron, Joliet; Mrs. H. M. Camp, Monmouth; Mrs. A. B. Middleton, Pontiac; Mrs. R. K. Packard, Chicago; Mrs. J. A. Wolfer, Chicago; Mrs. M. L. Hole, Danville; Mrs. F. O. Fredrickson, Chicago; Mrs. I. L. Foulon, East St. Louis; Mrs. Milo T. Easton, Peoria.

By Counties:

| | | |
|---|---|---|
| Cook County ..10 | Knox ..... 1 | Lee ..... 0 |
| Douglas ..... 2 | Livingston .... 0 | McLean ..... 0 |
| Marion ..... 0 | Randolph ..... 0 | R. Island ..... 1 |
| Saline ..... 0 | Sangamon ..... 1 | St. Clair ..... 2 |
| Vermilion ..... 2 | Warren ..... 1 | Will-Grundy ... 1 |
| Woodford ..... 2 | Montgomery ... 0 | LaSalle ..... 1 |
| TOTAL .....26 | Adams ..... 2 | |

A report was read at this time by Chairman of Credentials and Registration which was as follows:

*Tuesday,* 2:00 *P. M.*

| | | |
|---|---|---|
| Board officers ..... | 6 | |
| Councilors ..... | 4 | |
| Chairmen ..... | 10 | |
| | 18 | |
| Delegates ..... | 27 | (Explanation: two officers |
| Alternates ..... | 9 | were also chairmen.) |
| Members ..... | 51 | |
| Guests ..... | 98 | |
| Voting Body ..... | 39 | |
| | 203 | |

*Officers Reports:* It was moved by Mrs. Lucius Cole and seconded by Mrs. J. A. Wolfer that all reports be accepted as one. Motion carried.

The following officers gave reports: Mrs. H. B. Henkel, President-Elect, no report. Corresponding Secretary, Mrs. A. H. Baugher. Aside from official business, she reported sending letters of sympathy to Miss Jean McArthur of Chicago at the loss of her sister, to Mrs. R. J. Coultas of Mattoon at the loss of her husband, to Mrs. Lucius Cole when she injured her foot, and to Mrs. A. H. Brumback during her illness.

First Vice-President, Mrs. E. J. Berkheiser read her report which told of working with health programs in other organizations, always subject to the approval of the Medical Society, namely the Cancer Research Committee of the Chicago Woman's Club, and of arranging programs for the Lake View Woman's Club.

Second Vice-President, Mrs. I. L. Foulon, no report except that she attended the two Board Meetings and served as Recording Secretary pro-tem at the March 20 meeting.

Treasurer, Mrs. William Raim, read her report showing a balance on hand of $774.73. An itemized account appears in her report.

Recording Secretary, (pro-tem) Mrs. H. M. Camp, no report except taking of minutes at the morning session of the Board and County Presidents.

First Vice-President, Mrs. E. J. Berkheiser, takes the chair while the President reads her report.

Mrs. F. P. Hammond read an excellent report giving a brief resume of the work accomplished by each Chairman. Of especial interest was the announcement of the organization of three new counties, La-Salle, Montgomery and Adams, and of a new branch in Cook County, bringing the total there to eight.

Her report showed results of much outstanding work on many of her committees. She reported writing 310 letters, exclusive of letters of the Corresponding Secretary and of miscellaneous form letters. During the year she visited 12 counties and appeared on their programs. She worked especially hard to organize Peoria, and visited there six times. She reported two important actions of the Board:

1. Motion to have Mrs. R. K. Packard's resolution relative to assistance of Advisory Committee presented to the House of Delegates of the Illinois State Medical Society unanimously carried.

2. A motion that the Auxiliary go on record as cooperating with the Woman's Field Army of the American Association for Control of Cancer, unanimously carried.

In closing her report, Mrs. Hammond extended her thanks and appreciation to the Advisory Committee, Dr. R. R. Ferguson, Chairman, Dr. John R. Neal, Dr. R. K. Packard, and Dr. H. M. Camp; to Miss Jean McArthur, Dr. C. J. Whalen, Editor of the ILLINOIS MEDICAL JOURNAL; to Mrs. Milo T. Easton and her Convention Committee; to Mrs. H. B. Henkel the President-Elect, and Organization Chairman for her splendid report; and to each officer, Chairman and active Councilor.

Mrs. Hammond's report was accepted and received with a rising vote of thanks.

Mrs. H. B. Henkel, Organization Chairman, read a very commendable report showing an active and worth while year. Noteworthy facts in her report were the organization of three counties—namely, Montgomery County on December 16, 1936, in the Fifth District La Salle County on January 21, 1937 in the Second District; and Adams County on April 30, 1937, in the Sixth District.

Counties organized ..... 21 (19 active)

Membership in 1937.....793

The Counties that have been given permission to organize:

| | |
|---|---|
| Wabash ..... 9th District | Iroquois .....11th District |
| Fulton ..... 4th District | Carroll ..... 1st District |
| Belleville .....10th District | Crawford ..... 8th District |
| Lake ..... 1st District | Stephenson ..... 1st District |
| Clark ..... 8th District | Greene ..... 6th District |
| Du Page .....11th District | Macoupin ..... 6th District |

Counties visited during the year: St. Clair, Marion, Montgomery, Cook, Bureau, Adams, Fulton, La Salle, Peoria. (Speaker at seven of these counties.)

Contributed article to the ILLINOIS MEDICAL JOURNAL on organization work.

Mrs. Hammond complimented Mrs. Henkel on her work.

REPORTS OF COUNCILORS

*First District*: Mrs. Imas Rice, absent. Her report

read by Corresponding Secretary, Mrs. A. H. Baugher, which told of a fine year for Kane County. She told of need of contacting the McHenry County Auxiliary to increase the interest there.

*Second District:* Mrs. Raymond E. Davies reports enthusiastic organization of La Salle County on December 3, 1936. She reported attending all of their meetings but one. She reported an increase of 11 members in her Bureau County Auxiliary—a total now of 32 members.

Woodford County reported 100 per cent paid membership which is very outstanding.

*Third District:* Mrs. Lucius Cole reports attendance and active interest in following meetings:

1. All Board Meetings.
2. Majority of Cook County Meetings.
3. Visits Aux Plaines and Jackson Park Branches of Cook County.
4. Fall Board Meeting of Woman's Auxiliary to A. M. A.
5. Milwaukee County Auxiliary, Wisconsin.

Mrs. E. F. Meyers, absent. Report read by Corresponding Secretary, Mrs. A. E. Baugher. She reported attendance at all State Meetings but one. An interesting report from the President of the Englewood Branch told of a big Laity Day meeting in January with 20 organizations represented. Also noteworthy was a $25.00 donation to *Hygeia.*

Mrs. C. A. Hedberg, absent. Report read by Corresponding Secretary, Mrs. A. H. Baugher. Mrs Hedberg reported the activities of the North Side and North Shore Branches of the Woman's Auxiliary to the Chicago Medical Society

North Side Branch: 80 members, 12 new ones. Six educational meetings held during the year; three at hospitals and three at members' homes.

On March 15, Presidents and Legislative Chairmen of North Side Women's Clubs were guests of the Branch at a meeting of the Central Organization.

North Shore Branch: Very progressive year. Membership 85. Six regular meetings at homes and educational programs, and one benefit bridge. This Branch has established an "Educational Fund" for the children of doctors who may need assistance.

*Fourth District:* Mrs. F. E. Bollaert reports assisting at Tea on October 27, 1936 with guest speakers, Mrs. F. P. Hammond, Mrs. J. A. Wolfer and guests from Knox, Warren and Henry Counties in attendance. Mrs. Bollaert hopes to report organization of Henry County in the near future. April 21, 1937 Laity Day Tea, 140 in attendance. Attended a Warren County Meeting in Monmouth on May 12, 1937. Rock Island holds regular monthly meetings at the hospitals at the same time of the Doctors' meetings.

*Fifth District:* Mrs. J. E. Reisch absent, resigned—written report read by Corresponding Secretary, Mrs. A. H. Baugher. Mrs. Reisch reports working with Lincoln and Jacksonville ladies, but no definite contacts or results for an Auxiliary effected. She reports attending meetings in La Salle and Hillsboro with Mrs. Henkel.

*Sixth District:* No report.

*Seventh District:* Mrs. T. D. Laney, no report.

*Eighth District:* Mrs. E. S. Allen. Her district consists of 11 counties with 4 organized—Coles, Cumberland, Douglas and Vermilion. She reports an increase in her own Douglas County Auxiliary from 7 members in 1929 to 14 members in 1937. She reports Crawford and Clark Medical Societies have consented to an Auxiliary organization, but no unit has been organized as yet due to the small group.

*Ninth District:* Mrs. E. W. Burroughs, absent. Brief report by wire read by Corresponding Secretary, Mrs. A. H. Baugher. Report: no new contracts, and she attended three Saline meetings.

*Tenth District:* Mrs. R. F. Stanton, no report.

*Eleventh District:* Mrs. E. R. Steen, no report.

### Chairmen of Standing Committees

*Press and Publicity:* Mrs. V. M. Seron and her committee, Mrs. Moher, Mrs. Madden, submitted a full and interesting report.

1. Eleven counties sent in news items for year book.
2. Monthly article appeared in the Illinois Medical Journal, contributed by a Board Member.
3. Exhibit from Illinois Auxiliary prepared for National Exhibit in Atlantic City at request of National Chairman of Exhibits. (Exhibit by Janet Bruce, artist.)
4. News items received showed pronounced increase in interest and activity among the Auxiliaries.

*Legislation:* Mrs. W. D. Chapman. From her report she has had a very intensive year, keeping informed on harmful legislative bills and keeping all county legislative chairmen and all Board Members informed. Mrs. Chapman has been ably supported by the legislative chairman, Dr. John R. Neal of Springfield, Mrs. John R. Neal, and Mrs. W. R. Cubbins of Chicago.

Bills Contested: Dangers of U. S. Public Health Service being absorbed by newly created Department of Public Welfare of the Federal Government.

Article in *Literary Digest,* January 30, 1937, "Science and Medicine" dealing with Socialized Medicine, with medical profession misquoted. Feb. 27, 1937 issue, Dr. Morris Fishbein and Dr. Henry E. Perry, President Michigan State Society, corrected the errors.

In calendar of bills introduced in this session of State Legislature 236 out of 1,200 odd bills related to medical and public health matters.

Senate Bills 171 and 172 Chiropractic measures. These bills would legalize the licensure of chiropractics and set up an independent state examining committee made up of chiropractors. If passed these bills would noticeably lower educational standards and serve as an opening wedge for the osteopaths, mecho-therapists, naturopaths, and other drugless cults to demand their special board.

Doctors' wives in counties of this district were contacted even when county had no auxiliary.

House Bill 615—bill in favor of anti-vivisection, yet neither animal experimentation or vivisection is mentioned in the bill. Both are subtly prohibited, however, by implication. "It is the most clever and astute legislative manoeuver ever attempted in favor of anti-vivisection."

*Printing Chairman:* Mrs. H. M. Camp. Reported printing 200 revised copies of the Constitution and By-Laws at cost of $15.00, without map of Councilor Districts. Itemized account of stationery printed appears in her report. Total cost of printing for the year was $57.42, all of which has been paid to the Commercial Art Press. Approximately 375 letterheads printed on 1 side, 35 printed on both sides, and 250 envelopes will be turned over to the new President.

*Program Chairman:* Mrs. A. B. Middleton, read a splendid report, in part as follows:

1. Assisted in compilation of Handbook for County Auxiliary.
2. Published article in ILLINOIS STATE MEDICAL JOURNAL on "Programs."
3. Sent 24 packages suggesting topics for "Health Programs."
4. Sent questionnaire to 20 County Presidents, all responded except Marion County.
5. Report of year's program sent to National and Regional Program chairman.

Summary of Reports on Questionnaire:

1. Fourteen Counties have program chairmen.
2. Twelve Counties meet at same time as County Medical Society.
3. Average attendance for all Auxiliaries, 50 per cent.
4. Seven counties used the Handbook for County Program Chairmen.
5. Sangamon County has their programs planned and printed at the beginning of the year.
6. St. Clair County Public Relations Committee held a meeting inviting all program chairmen, and Presidents of Social, Civic, Cultural, and Parent-Teachers Groups—87 officers of different groups attended.

(They were told speakers would be sent to their organization free to talk on health subjects if they would only ask for them, 50 per cent availed themselves of this opportunity.)

7. One of St. Clair County's members broadcast over WTMB the first Friday of each month, talks prepared by the A. M. A. were read.
8. Nine Counties had a Laity Day.
9. Thirty-two social meetings were held.
10. Four Counties reviewed *Hygeia* every meeting —all encourage home reading of *Hygeia.*
11. Seven counties reviewed editorials from the ILLINOIS MEDICAL JOURNAL.

Auxiliaries having the most meetings in the year have the best programs and the largest attendance. Also where there is an active Medical Society and a regular time for meetings, and the Auxiliary meets at the same time, it is more progressive and successful.

*Public Relations:* Mrs. John A. Wolfer, chairman for her second year, gave a very energetic and commendable report. In part:

1. Outline of this year's questionnaire sent to all counties, reports from which "proved that this year Auxiliaries stressed:
   a. Self and lay education.
   b. Hygeia.
   c. Legislation.
   d. Radio program interest increased.
2. Twenty Laity Days reported. Nine held downstate, and 11 in Cook County, with a wonderful attendance at all Laity Day Programs reported. Kane County heads the list with an attendance of 300.
3. Library of books about doctors not fully appreciated as yet.
4. Records of members affiliations with other organizations well kept up and pleasing to note.
5. Most counties use parties for raising funds. Several Medical Society groups donate funds to their auxiliaries.
6. More attention should be shown:
   a. Reports show insufficient number of subscribers to National News Letter.
   b. Magazine articles.
   c. Dr. Cramp's articles on harmful drugs.
   d. Periodic health examinations.

Mrs. Wolfer reports attending all meetings. She spoke before Rock Island County Auxiliary, New South Chicago branch, New Irving Park branch, being a guest at Will-Grundy Laity Day, and writing for the November 1936 issue of the Illinois Medical Journal, and sending 100 radio announcement cards to St. Clair County.

Reports to be continued Wednesday morning as the Tea and Musicale at Peoria Country Club was scheduled for 4:00 o'clock.

A motion was made by Mrs. Lucius Cole and seconded by Mrs. H. B. Henkel for adjournment. Motion carried. Meeting adjourned.

*Tuesday Afternoon, May* 18, 1937

The business meeting was adjourned before completion to enable the ladies to enjoy a tea and musicale at the beautiful Peoria Country Club.

A lovely musical program was enthusiastically received.

*Program*

Mrs. Harry Lloyd, violinist; Mrs. Gilbert Geiger, soloist; Mrs. Harry A. Durkin, accompanist; and Master Harry A. Durkin, piano soloist.

*Tuesday Evening, May* 18, 1937

A very enjoyable dinner-bridge was held at the Jefferson Hotel.

Chairman—Mrs. F. M. Meixner, Mrs. E. C. Kelly, Mrs. R. A. Hanna and Mrs. A. D. Phillips.

Mrs. F. P. Hammond presided at the speakers' table and introduced Mrs. Robert Fitzgerald, National President; Mrs. Milo T. Easton, Convention Chairman, and Mrs. Eben J. Carey, National Treasurer. Dr. Rolland L. Green, retiring president of the Illinois State Medical Society, gave a word of greeting and Dr. Rollo K. Packard delivered the address of the evening. Following dinner, a program was much enjoyed with bridge later. Lovely guest prizes were given to those participating in bridge.

Respectfully submitted,

DORIS H. CAMP,
Recording Sec'y, pro-tem.

*Wednesday Morning, May* 19, 1937

8:00 o'clock—Breakfast for Incoming Board Members, Jefferson Hotel.

9:30 o'clock—Business Session, Jefferson Hotel.

The Second Session of the Annual Business Meeting of the Woman's Auxiliary to the Illinois State Medical Society was opened at 9:30 A. M., May 19, 1937, in the Jefferson Hotel with the President, Mrs. F. P. Hammond presiding.

A silent tribute was given in memory of those who have passed on during the past year.

Due to the shortness of time before the Presidents' Luncheon, it was decided that the minutes of yesterday's session not be read, but later approved by a special committee to be appointed by the incoming President, Mrs. H. B. Henkel.

The following responded to roll call:

| | |
|---|---|
| Officers | 6 |
| Councilors | 3 |
| Delegates | 20 |
| Alternates | 1 |
| Chairman | 6 |
| Total | 36 |

The business session opened with a continuation of chairmen's reports.

Chairman of *Hygeia*, Mrs. M. L. Hole, read her report, which was, "In part."

She reported, attending all Board Meetings.

2. Preparing an article for February ILLINOIS MEDICAL JOURNAL.

3. Arranging for *Hygeia* Exhibit at State Meeting.

4. Compiling list of *Hygeia* subscribers throughout the State.

5. Winning of $50.00 prize by Illinois for Group 3—200 members and over. (Cook County brought in 406 subscriptions to win.)

She reported that the period of May 1, 1936 through April 30, 1937 showed a grand total of 579 subscriptions.

A motion was made by Mrs. Saunders to accept all reports as a whole, which was seconded by Mrs. Wm. Raim. Motion carried.

Revision Chairman, Mrs. R. K. Packard read revisions of Constitution and By-laws.

### CONSTITUTION AND BY-LAWS

### *Article III*—Dues

Add: The word "Organization" before dues. To read: "Organization and Dues."

Article III.—Organization and Dues. (p. 8—new constitution).

Add: New section.

Section 2 (a) A County Medical Society having less than fifty (50) members, two or more Counties may organize an Auxiliary with the consent of the Medical Societies.

Add: New paragraph.

Section 2 (b) Each County Auxiliary shall submit its Constitution and By-Laws to the State Auxiliary Board for approval.

### *Article VI*—Nominations and Elections

Section 5—Qualifications (p. 10—new constitution).

Add: (a) To first paragraph.

Add: (b) New paragraph.

No one shall serve as President-Elect who has not been an active member in her County Auxiliary serving as an officer or chairman.

*Revision Committee*
Mrs. A. H. Brumback,
Mrs. Clarence Goodwin,
Mrs. Rollo K. Packard, Chairman.

March, 1937

After discussion on revisions for Article III, it was moved by Mrs. R. K. Packard, seconded by Mrs. Lucius Cole that these revisions be adopted. Motion carried. Revision adopted.

After considerable discussion regarding (b) of Section 5, a motion was made by Mrs. A. B. Middleton and seconded by Mrs. W. D. Chapman that the word "Councilor" be substituted in this paragraph, for "Chairman." Motion carried and paragraph adopted as amended.

Mrs. F. O. Fredrickson—Chairman of Finance read the report of the Finance Committee for 1936-1937 and the Proposed Budget for 1937-1938 Based upon a membership of 900.

### REPORT OF FINANCE COMMITTEE 1936-37 AND PROPOSED BUDGET 1937-38

This Committee presents the following record of expenditures for the year 1936-37, showing also the budget as planned for 1936-37 as follows:

| | 1936-37 Budget | Expended | Balance on hand | Overdrawn |
|---|---|---|---|---|
| President— | | | | |
| Postage, Telephone, Transportation | $135.00 | $ 99.05 | $ 35.95 | .... |
| Corr. Secy. | .... | .... | .... | .... |
| Organization— | | | | |
| Telephone, Postage | 50.00 | 58.55 | .... | $ 8.55 |
| Transportation | .... | .... | .... | .... |
| Program— | | | | |
| Public Relations | 40.00 | 15.97 | 24.03 | .... |
| Hygeia | .... | .... | .... | .... |
| Legislation | .... | .... | .... | .... |
| Telephone & Postage | 40.00 | 31.37 | 8.63 | .... |
| Printing, Stationery | 60.00 | *121.11 | .... | 61.11 |
| Mimeographing | .... | .... | .... | .... |
| Board Transportation | 100.00 | 79.24 | 20.76 | .... |
| National Dues | 175.00 | **203.50 | .... | 28.50 |
| Miscellaneous | 100.00 | 81.51 | 18.49 | .... |
| | 700.00 | 690.30 | 107.86 | 98.16 |

Total Budget 1936-37 ..... $700.00
Total Expenses 1936-37 ..... 690.30
$ 9.70

*Includes New Issue Constitution & By-Laws.
**Current members—21 in arrears—Total 814.

### PROPOSED 1937-38 BUDGET BASED UPON MEMBERSHIP OF 900

| | |
|---|---|
| President | $175.00 |
| Organization | 100.00 |
| Program | 50.00 |
| Telephone & Postage | 50.00 |
| Printing, Stationery & Mimeograph | 100.00 |
| Board Transportation | 100.00 |
| National Dues | 225.00 |
| Miscellaneous | 100.00 |
| | $900.00 |

Respectfully submitted,
Mrs. William Raim
Mrs. R. K. Packard
Mrs. A. H. Brumback
Mrs. F. O. Fredrickson, Chrm.

Mrs. R. K. Packard moved that the report be accepted. Mrs. H. B. Henkel seconded the motion. Motion carried.

Chairman of Archives, Mrs. John Soukup, was not present.

A written report was submitted which was read by the corresponding Secretary, Mrs. A. H. Baugher. "In Part."

1. In response to a request for histories written to twenty counties—only ten have replied.
2. Reports that McHenry County has ceased to function.
3. Reports organization of three new counties.
   a. LaSalle
   b. Montgomery
   c. Adams
4. Reports files for Women's Auxiliary being in good condition with contents listed.

Chairman of Hostess Committee—Mrs. A. H. Brumback, absent. No report.

Chairman of Credentials and Registration—Mrs. I. L. Foulon.

This final report was read by Mrs. Foulon.

| | | | |
|---|---|---|---|
| Officers | 6 | Members | 60 |
| Councilors | 4 | Guests | 173 |
| *Chairmen | 10 | Total Registered | 291 |
| Total Board | 18 | *Two of chairmen were also officers. | |
| Delegates | 28 | | |
| Alternates | 12 | | |

Mrs. Foulon submitted no written report for her year's work but gave an oral report telling of attending the Board Meetings and of enjoying her work.

At this time announcement was made of a paper to be read by Mrs. John A. Wolfer at Radio Station WMBD on behalf of its author Dr. A. H. Brumback, entitled, "The Old Time Doctor."

It was suggested that the paper be read to the group at the close of the business session.

Convention Chairman—Mrs. Milo T. Easton gave an oral report. She especially spoke of the pleasure she had derived in working to make the Convention arrangements a success and took this opportunity to thank all who contributed to that success for their co-operation.

A rising vote of thanks was given to Mrs. Easton in recognition of a delightful convention.

### County President's Reports

1. Rock Island County—Report submitted by the President, Mrs. Harold Parsons, absent. Report read by Mrs. Youngbird, delegate.
2. Adams County—Organized April 30, '37. No report.
3. Bureau County—Report submitted by President, Mrs. R. E. Davies. Mrs. Davies introduced Bureau County's new President, Mrs. Hammond welcomed their new President, Mrs. Nix, and expressed her hope that she would lead the Bureau County Auxiliary in the same commendable manner in which Mrs. Davies lead them.
4. Coles-Cumberland County—Report submitted by Mrs. F. M. Brayshaw—absent. Report read by Corresponding Secretary, Mrs. A. H. Baugher.
5. Cook County—Splendid report submitted by Mrs. G. Henry Mundt, President.
6. Douglas County—Report read by Corresponding Secretary, Mrs. A. H. Baugher. Report signed by the President, Mrs. Phillips.
7. Kane County—Mrs. E. M. Thomas asked permission to mail her report to the Corresponding Secretary due to the fact that it was partially damaged.
8. Knox County—Oral report given by retiring President and delegate, Mrs. G. C. Klein due to illness of the new President, Mrs. C. A. Ross. Written report handed in later.
9. LaSalle County—New county. No report. Mrs. R. E. Davies introduced the President, Mrs. De Vries, who was in turn welcomed by our President, Mrs. Hammond.
10. Livingston County—Mrs. A. B. Middleton gave an oral report, reporting that the County had elected officers and had thirteen paid up members.
11. McHenry County—Mrs. Frank Alford, President. No representation. No report.
12. Montgomery County — Newly organized — no written report but splendid oral report given.
13. McLean County—Splendid report by Mrs. B. L. Rypins, new President who was introduced and welcomed by Mrs. Hammond.
14. Marion County—Mrs. T. D. Laney, President —no report.
15. Sangamon County—Mrs. S. R. Magill, President, read a splendid report of their year's work. Noteworthy was their year book containing complete program and which serves as an excellent guide to their members.
16. St. Clair County—Excellent report read by Mrs. C. C. Winning, President.

Interest Notes: a. A ten minutes review of *Hygeia* is read at each monthly meeting.

b. Members gave nine radio broadcasts this year from material furnished them by A.M.A.

c. Closing quotation—"We have armed ourselves with the knowledge of anti-medical movements, Health, Insurance, State Medicine, etc., and we quietly move among the laymen, spreading the gospel of organized medicine, and feeling that at least an integral part of that magnificent group of men, the Illinois State Medical Society, known as our husbands.

17. Vermilion County—Report submitted by the President, Mrs. Carrie W. Sistler—absent. Report read by Mrs. I. J. Scott, Second Vice-President.

Interest Note: a. Ten regular meetings held.

18. Warren County—Report read by Mrs. W. A. Frymire, delegate. Report submitted by Mrs. H. M. Camp, Secretary.
19. Will-Grundy County—Report submitted by Mrs. Matt Bloomfield, President—absent. Report read by Mrs. Worthley, delegate. Report told of a very active year.

Interest Note: a. This county has established a circulating library, buying five books, which are eventually to be presented to the Library. Each book bears a book plate with their Auxiliary inscribed on it.

20. Woodford County—Report submitted and read by the President, Mrs. Helen Nickel.

Interest Note—One Hundred per cent membership—Perhaps only one other county throughout National Organization has this distinction.

Resolutions Chairman—Mrs. J. P. Simonds and her committee of Mrs. F. O. Fredrickson and Mrs. A. B. Middleton submitted a written report—which was read, by the Corresponding Secretary, Mrs. A. H. Baugher for Mrs. Simonds, who was also present.

*Report of the Committee on Resolutions*

Madame President and Members:

The Committee on Resolutions Presents the following report:

*Resolved,* That the Women's Auxiliary to the Illinois State Medical Society in convention assembled extends its sincere thanks to the following:

To Mrs. Milo Easton, Peoria, Illinois, Convention Chairman and to all members of her committee who have so generously and hospitably planned and executed the details of the convention;

To Mrs. I. L. Foulon, Chairman of Committee on Credentials and Registration, and to her committee;

To Dr. Harold M. Camp, Secretary of Illinois State Medical Society for assisting in Convention Registration and in other plans for this meeting;

To Police Lieutenant Hathaway of the City Traffic Department of Peoria for escorting the Auxiliary on trips over the city;

To Rev. William Atkinson Young, pastor of the First Presbyterian Church of Peoria, for the invocation at the opening meeting;

To Dr. Rollo K. Packard, President-Elect, Illinois State Medical Society, for his address Tuesday evening;

To Dr. Frank J. Jirka, Director of the State Department of Public Health, for his address Wednesday;

To the management of the Jefferson Hotel for the courtesies extended the convention;

To the *Peoria Star,* and the *Peoria Journal Transcript* for the generous space allowed the Publicity Committee;

To Mrs. Robert E. Fitzgerald, the President of the Women's Auxiliary to the American Medical Association, for her inspiring and informative address at Tuesday's luncheon;

To Mrs. Frank P. Hammond, President of the Women's Auxiliary to the Illinois State Medical Society, for the time she has given so generously, loyally and devotedly to the Auxiliary;

To all the members of the State Board whose cooperation has made possible the fine reports of this Convention.

Respectfully Submitted,
(Signed) Nora C. Fredrickson
Mrs. F. O. Fredrickson
Mrs. A. B. Middleton
(Signed) Minnie Simonds
Mrs. J. P. Simonds,
Chairman

Mrs. Simonds stated that if there were any omissions in her report, she would be glad to insert them later.

Mrs. Simonds moved the report be accepted, Mrs. Lucius Cole seconded the motion. Motion carried.

Nominating Committee—Report read by Mrs. E. J. Berkheiser.

*Report of the Nominating Committee*

OFFICERS

President—Mrs. Herbert B. Henkel, 2135 Wiggins Avenue, Springfield, Illinois.

President-Elect—Mrs. A. H. Baugher, 5214 Greenwood Avenue, Chicago, Illinois.

Corresponding Secretary—Mrs. S. R. Magill, East Lake Shore Drive, R. R. No. 3, Springfield, Illinois.

First Vice-President—Mrs. Charles C. Winning, 763 Vogel Place, East St. Louis, Illinois.

Second Vice-President—Mrs. John A. Wolfer, 415 Surf Street, Chicago, Illinois.

Third Vice-President—Mrs. E. G. Beatty, 621 W. Lincoln, Pontiac, Illinois.

Treasurer—Mrs. William Raim, 178 North Euclid Avenue, Oak Park, Illinois.

Recording Secretary—Mrs. F. L. Heck, 1425 June Way Terrace, Chicago, Illinois.

COUNCILORS

First District—Mrs. A. E. McCornack, 265 Hamilton Avenue, Elgin, Illinois.

Second District—

Third District—Mrs. J. P. Simonds, 25 East Walton Place, Chicago, Illinois; Mrs. Lucius E. Cole, 1117 Lathrop Avenue, River Forest, Illinois; Mrs. A. H. Brumback, 1503 Jackson Boulevard, Chicago, Illinois.

Fourth District—Mrs. F. E. Bollaert, 906 20th Avenue, East Moline, Illinois.

Fifth District—Mrs. Winston H. Tucker, 539 South Grand West, Springfield, Illinois.

Sixth District—Mrs. Walter Whitaker, Main Street, Quincy, Illinois.

Seventh District—Mrs. Thos. D. Laney, 2111 West Main Street, Salem, Illinois.

Eighth District—Mrs. Gerry Brown Dudley, Charleston, Illinois.

Ninth District—

Tenth District—Mrs. Henry H. Hurd, 1360 North 42nd Street, East St. Louis, Illinois.

Eleventh District—Mrs. V. R. Seron, 1806 N. Williams St., Joliet, Illinois.

Signed by:
Ethel L. Magill
Florence H. Thomas (Mrs. E. M.)
Ethel L. Savage (Mrs. R. G.)
Eva M. Packard
Gladys Berkheiser (Mrs. E. J.)
(Chairman)

Mrs. Lucius Cole moved that the nominations for officers be accepted as read. Mrs. H. B. Henkel seconded the motion. Motion carried.

Introduction of new President, Mrs. H. B. Henkel and handing over of gavel by Mrs. Hammond.

Presentation of President's pin to Mrs. Hammond by Mrs. Chapman. Mrs. Chapman stated that it was a great pleasure to present this pin to Mrs. Hammond who had served so faithfully in the offices of Corresponding Secretary, Chairman of Press and Publicity, Treasurer (2 years), and President.

Mrs. Hammond acknowledged her sincere thanks to Mrs. Chapman and the group.

Mrs. H. B. Henkel gave a brief welcoming speech at this time.

Mrs. John A. Wolfer read Mrs. A. H. Brumback's radio presentation entitled, "The Old Time Doctor," which was greatly enjoyed by all present.

Mrs. Henkel asked for motion for adjournment.

Meeting adjourned by proper action.

*Wednesday Afternoon, May* 19, 1937

1:00 o'clock President's Luncheon.

The President's Luncheon was held at the Jefferson Hotel in honor of Mrs. F. P. Hammond.

LUNCHEON PROGRAM

Mrs. F. P. Hammond, presiding.

Introduction of Past Presidents by Mrs. Hammond.

Mrs. G. Henry Mundt, Mrs. Lucius Cole, Mrs. R. K. Packard, Mrs. W. D. Chapman, Mrs. John R. Neal.

Introduction of President-Elect, Mrs. A. H. Baugher, Chicago. Also of Dr. A .H. Baugher, Dr. H. B. Henkel, Dr. F. P. Hammond.

Mrs. F. P. Hammond spoke on the Auxiliary progress made in Illinois with 21 organized counties to our credit, and of the honor of having three of our members on the National Auxiliary Board, namely, Mrs. R. K. Packard, Mrs. J. P. Simonds, and Mrs. Lucius Cole. She spoke of the privilege of belonging to an organization of 16,000 women who compose the National Organization, with all of us working for the same aims.

Presentations:

At the conclusion of Mrs. Hammond's address, her Jackson Park Branch presented her with a lovely corsage as a token of their esteem and affection, to which she graciously responded.

Presentation of silver tray by Mrs. R. K. Packard on behalf of the Board Members—gracious response by Mrs. Hammond.

Introduction of Mrs. H. B. Henkel, incoming president, by Mrs. F. P. Hammond. Mrs. Hammond especially praised Mrs. Henkel for her organization work throughout the year.

Presentation of beautiful basket of flowers to Mrs. Henkel by a member of the Sangamon County Auxiliary, and lovely response by Mrs. Henkel.

Introduction of Mrs. Milo T. Easton and expression of appreciation for her work before and during the convention, by Mrs. Hammond.

elected officers.

Interduction by Mrs. H. B. Henkel of her newly

Introduction of Dr. Frank J. Jirka, Director, State Department of Public Health, Springfield.

Address by Dr. Jirka. Interesting and vivid address on the flood in southern Illinois with movies.

Adjournment for tour through Hiram Walker Distillery.

*Wednesday Evening, May* 19, 1937

President's Dinner and Dance, ballroom of the Hotel Pere Marquette.

*Thursday Morning, May* 20, 1937

8:00 Board Breakfast—Guests of Mrs. F. P. Hammond, President of the Auxiliary.

9:30 Post-Convention Board Meeting—Mrs. H. B. Henkel, new President, presiding, at the Jefferson Hotel.

Respectfully submitted,

DORIS H. CAMP,

Recording Sec'y Pro Tem

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## A CAMPAIGN AGAINST TRACHOMA

Trachoma, that dread eye-disease the cause of which is unknown, has for decades been prevalent in southern Illinois. Other sections of the state have largely escaped its ravages, but in 14 of the southern counties, there has been a steadily increasing concentration of this type of conjunctivitis.

Many of the sufferers live in poverty on isolated farms and, even though the Illinois Society for the Prevention of Blindness offered to give them weekly treatment, frequently they could not obtain transportation to the society's clinics.

Obviously, it was necessary to provide not only facilities for treating the disease, but also some means of transportation for the hundreds of rural sufferers. And since the trachoma-infested area comprises some 3,000 square miles, this problem of transportation gave the officials their biggest headache.

The problem was solved, however, by the Works Progress Administration.

A project, sponsored jointly by the Illinois Department of Public Health and the Illinois Society for the Prevention of Blindness and put into operation by WPA, now provides 20 bus runs covering the 93 towns in the 3-000-square-mile area where trachoma is most prevalent.

Besides bringing into the clinics patients from surrounding towns and villages, the WPA buses also pick up trachoma sufferers along the highways and byways of their routes.

To reach the bus-routes, the patients walk, ride horses or thumb lifts in wagons or in any other available vehicle. For instance, into the Shawneetown clinic one day stalked an elderly woman dressed in a wrapper and a sunbonnet. She looked as if she had stepped out of a story book of the last century. She had ridden a horse bareback the three miles from her house to the bus-line. There she had tied her horse, got in the bus and traveled 20 miles more to town for the treatment. Afterward the bus took her back, and she unhitched her horse and rode home. She was 69 years old.

Trachoma clinics are in operation at Harrisburg, Vienna, Shawneetown, Herrin, Eldorado and Jonesboro.

Occasionally these clinics are located in somewhat unusual places. In Vienna, for example a library basement was made available for the trachoma work; WPA renovated it and provided adequate equipment. At Jonesboro an old jailhouse was turned into a clinic; WPA repaired the building and made it suitable for medical work.

About 3,000 cases, including several hundred suspected victims, are receiving treatment in the five clinics.

When the disease is not too far advanced, complete cures are possible, and even in extreme cases the program of the disease may be checked and the advent of blindness at least, postponed.

The trachoma clinics are effecting a genuine saving for Illinois taxpayers. Pensions for the blind in Illinois average $5,000 a day, according to Miss Audrey Hayden, director of the Illinois Society for the Prevention of Blindness, and the education of a blind child in a state institution costs about $800 a year. WPA funds for bus clinic service amounted to $20,000, to which the state added $25,000 and the Society for the Prevention of Blindness $6,000. Figuring conservatively, if, on an average, blindness in the 1,500 patients is postponed one year, the state will save in blind pensions during that year approximately $180,000.

Clinic reports indicate, however, that blindness will be in many instances entirely prevented, and in others indefinitely postponed.

This campaign against trachoma is merely one of many similar activities of the Works Progress Administration. During the past two years WPA has initiated scores of health projects. Thousands of individuals have been taken from relief rolls and given employment an sanitation and health projects all over the country The average number of WPA workers engaged in this type of work has been 78,000.

## TREATMENT OF HYPERTROPHY OF PROSTATE WITH ESTROGEN

Wugmeister (Paris Medical, June 12, 1937) maintains that hypertrophy of the prostate is due to a hypervirilization of the organism, which takes place during the presenile age because of a deficiency in estrogen. When the anterior hypophysis is no longer inhibited by the estrogen, it produces an excess of its gonadotropic hormones, which in turn stimulate the genital glands. The glandular tissue which hesponds most to this stimulation is that of the periurethral glands and, if the excessive production persists for long periods, hypertrophy of the prostate results. The author admits that this hypothesis is in complete contradiction to that of several other investigators, who maintain that the hypertrophy of the prostate results from a deficiency in testis hormone and a predominance of the estrus-producing hormone. He points out that, if the latter theory corresponded with the facts, the injection of large doses of estrogen would result in an aggravation of the symptoms of hypertrophy of the prostate. This, however, is not so. On the contrary, large doses of estrogen effect an amelioration of the condition. The author resorted to the administration of large doses of estrogen in twenty-three cases of hypertrophy of the prostate. In sixteen of these cases the improvement was marked: there was a diminution in the nocturnal pollakiuria (one or two nocturnal micturitions instead of the former four or six), an improvement in the difficulties at micturition and a reduction in the residual urine. In four other cases the residual urine remained unchanged but the subjective symptoms were considerably improved. The three remaining patients were not improved. Regarding the method of the treatment, the author says that it must be continued for at least twelve weeks and that at least 100,000 international units of estrogen must be injected per week. At first the weekly dose may even be 200,000 units, but as improvement becomes noticeable the weekly dose can be diminished to 10,000 units.

## ERYSIPELAS TREATED WITH PRONTOSIL

Breen and Taylor, in London Lancet, June 5, 1937, say: Of their forty-five cases of erysipelas (forty-one of the facial variety), in which they used prontosil in one or another form in thirty-five. All patients were in addition painted locally twice daily with a mixture of glycerin and ichthammol. There were two deaths. Of thirty-five patients treated with prontosil from admission, thirty-three had regressed, one had spread and one was stationary forty-eight hours later. There was one subsequent relapse. Of the ten control cases not treated with prontosil, four had regressed, five had spread and one was stationary forty-eight hours later. There were no relapses. Of the five cases which had spread, three were subsequently treated with prontosil, and within forty-eight hours they had also regressed. The average temperature of the prontosil cases fell to normal or below in forty-eight hours, whereas the average of the other cases remained above normal. As regards the pulse, the advantage lies with the no prontosil group, but as they were clinically milder cases, this was reflected in the lower temperature and pulse rate on admission. The drug was administered by mouth in all but two patients, two tablets of sulfanilamide of 5 grains (0.3 Gm.) each were given three times daily to adults, smaller doses proportionately to body weight being given to children. The single relapse in the prontosil group occurred on the tenth day, but this yielded so promptly to a resumption of treatment that the patient was discharged a week later. The average length of stay in the hospital in the prontosil cases was 18.4 days, which compares favorably with the figure of 23.8 days in the other series.

## FATTY ACIDS IN RELIEF OF COMMON COLD

Boyd and Connell, Canadian Medical Association Journal, July, 1937, announce the following conclusions: Following a control period of seven weeks, beginning January 1, during which colds were recorded, they gave 15 minims (1 cc.) of purified linoleic and linolenic acids (vitamin F) daily to forty-one medical students for a further seven weeks, while sixty-five others served as controls. Vitamin F reduced the average incidence of colds by 64 per cent and the average duration by 78 per cent, there being at the same time little appreciable difference in the incidence and duration of the untreated group. Of the treated group, 71 per cent responded favorably and 29 per cent showed no relief. Unpleasant reactions occurred in one-third of the treated cases, diarrhea, nausea and vomiting being the chief side effects, but most of these were temporary and disappeared when the substance was taken with, rather than between meals.

## Original Articles

# POLIOMYELITIS

### With a Review of 139 Patients

ARCHIBALD L. HOYNE, M. D.

CHICAGO

As the years pass we find an ever increasing interest in the subject of poliomyelitis. Intensive study is undoubtedly stimulated by public sympathy for those afflicted with the disease; it is also due in large measure to the unsolved problems connected with the infection.

Underwood, an English physician, directed attention to infantile paralysis as early as 1774. Because of the age at which children were attacked most frequently he associated the paralysis with teething. Later Heine, a German orthopedic surgeon, made valuable contributions to our knowledge when in 1840 he called attention to the existence of symptoms that preceded the paralysis. Medin in 1890 published his pathological findings. Due to the work of these investigators poliomyelitis was often referred to as Heine-Medin's disease. It was not, however, until after Wickman's study in 1905 that a wide range of investigative work was undertaken. Wickman not only established the contagiousness of the disease and that it could be transmitted by human carriers but he also recognized that poliomyelitis could occur without paralysis. These observations were real advances in the comparatively limited knowledge of the epidemiology and symptomatology that had previously existed. The experimental studies of Landsteiner and Popper, Flexner and Lewis and many others in more recent years are well known. Still we are not acquainted with the precise facts that are necessary for control of the disease which we believe is due to a virus.

Originally infantile paralysis was the term used to describe the malady. Today we are inclined to regard any paralysis that occurs as a complication of an acute systemic infection. This viewpoint has an important bearing on the disease from both an epidemiological and a therapeutic standpoint. If all poliomyelitis patients do not have paralysis how can we justify the use of such an expression as the "pre-paralytic stage" when discussing a patient who has no paralysis? It seems more correct to speak of non-paralytic and paralytic cases. This limitation of terms becomes particularly evident when we consider that some have estimated as high as 80% of all poliomyelitis patients have no paralysis. If this is true there must be many convalescent carriers who are never detected and consequently spread the infection unmolested.

Age has always been an important factor in those attacked. In this respect there is a striking similarity to measles. Both diseases are particularly common in the same age groups. Poliomyelitis like measles is unusual before six months. Both diseases are infrequent among adults in urban populations. In large cities few adults contract measles because nearly all have gained immunity by an attack during childhood. Is the same explanation applicable to poliomyelitis? Is it not possible that most of the population in a large city has had poliomyelitis without paralysis during the early years of life. In small towns and country districts there is a larger percentage of adults who have escaped measles in childhood than is to be found in the cities. A higher percentage of adults is usually attacked by poliomyelitis in country districts because they lack immunity from infection in childhood.

In the 1916 Chicago outbreak of poliomyelitis about 86% of the patients were 5 years of age or less. During the year 1936 there was considerable difference in regard to the age factor as shown in the following table:

*Age Groups for 139 Hospital Patients*

| | | | |
|---|---|---|---|
| Under 1 Yr. —4 | 6-10 —50 | 16 + —14 |
| 1-5 —54 | 11-15 —17 | |

Here it may be seen that only 41.7% of the patients were 5 years of age and less, and that 22.3% were more than 10 years of age.

Distribution between the sexes in our cases shows there were 75 males and 64 females. This ratio is customary.

Various characteristics have been described as being prominent among those who are susceptible to poliomyelitis. The colored race seems to be relatively exempt from the disease and this impression is supported by the small number (4) included in our 139 patients. Some years ago I referred to the fact that blondes appeared to be much more frequent victims than brunettes.[1] A short time later it was reported from New York

From the Municipal Contagious Disease Hospital, Chicago Board of Health.

Read before the Section on Public Health and Hygiene, Illinois State Medical Society, Peoria, May 19, 1937.

that the disease was very prevalent among the Italians of that city. Others have stated that children with widely spaced upper incisors seemed especially prone to contract the disease. The value of such observations is of course doubtful. However, it is a fact that most poliomyelitis patients are exceptionally well nourished, robust children.

The influence of season on the prevalence of poliomyelitis is more evident than ordinarily manifest in the case of other contagious diseases. Epidemics are most often encountered during hot dry weather. July, August and September are the months commonly associated with poliomyelitis though sometimes the peak is not reached until October. In 1936 our hospital patients were distributed as follows: June 2, July 3, August 9, September 61, October 55, November 8, and December 1.

Why a contagious disease should thrive in the summer months when the opportunities for close contact are less than in the winter is difficult to understand. However, insects which might be considered with such an occurrence seem to have been excluded as vectors. But those who believe the infection enters by way of the digestive tract point out that the summer months would be a favorable time for an epidemic. Diarrrheal diseases prevail in the summer and may be occasioned by spoiled foods. Therefore it is contended if poliomyelitis enters by way of the gastrointestinal tract the disease should be most common in the warm seasons. Changes that have been noted in Peyer's patches and the lymphatic system tend to uphold the gastrointestinal theory of infection. Strauss held this view in 1907; later Burrows did likewise and more recently Toomey has advanced a similar opinion. Nevertheless Brodie[2] has stated that the idea of the disease beginning as a general systemic invasion is erroneous.

In our series 18 patients were recorded as having no paralysis. This figure represents more than 12% of the total cases. In 74 instances or 53.2% the paralysis involved one or both lower extremities and one upper extremity. There were ten patients who had paralysis of both upper and both lower extremities. The proportion in which the lower extremities are affected is a reason sometimes given for believing the primary seat of infection is located in the intestinal tract. Sixteen patients were classified as bulbar cases.

When poliomyelitis is prevalent there is always the greatest concern for those who may be susceptible. Appeals are constantly made to the family physician for advice on the subject. Anything offered to the public as a preventive is seized upon with avidity. Twenty years ago we were told not to use antiseptics as nasal douches or sprays because by so doing we removed any protective properties that might be present in the nasal secretions. Today we are offered first a picric acid preparation and more recently a zinc sulphate solution to coat the nasal mucosa and thus prevent poliomyelitic infection. In the meantime there are those who claim the nose is not the portal of entry for the disease; that infection takes place by way of the digestive tract. This theory has been alluded to previously. Thus far the various proposals for prophylaxis are of extremely uncertain value. There is nothing which has been demonstrated to be of unquestioned efficiency.

Neither Kolmer's attenuated virus nor Brodie's vaccine has been given much approval for the purpose of establishing active immunity. This is one of the problems still to be solved. Use of the attenuated virus has been regarded by some as not without danger. The vaccine is said to lack the protective qualities originally claimed for it.

Passive immunization may be attempted with the use of human convalescent poliomyelitis serum. If this seurm is of any real value its worth should be most apparent when given for the purpose of prevention. However, the general impression seems to be that convalescent poliomyelitis serum does not confer a passive immunity. Some even go so far as to state that patients receiving it have developed unusually severe attacks of poliomyelitis. If we believe the foregoing expressions of opinion we must conclude that there is no satisfactory remedy that can be used for the prevention of poliomyelitis. Normal adult blood has also been used and is said to contain protective properties which often equal those found in convalescent serum.

When a diagnosis of poliomyelitis is made isolation of the patient should be immediate. Only in the midst of an epidemic when every illness is suspected of being the beginning of poliomyelitis is it likely that the disease will be diagnosed before paralysis appears. Nevertheless, some place great emphasis on the importance of ad-

ministering convalescent serum during the "preparalytic stage." If serum is given when there is no paralysis present and if paralysis does not develop after the injection of serum it is usually claimed that the treatment prevented paralysis. But since there may be, as we have said before, as high as 80% of poliomyelitis patients who do not have paralysis how can any one maintain that he has warded off a catastrophe when there were less than 20 chances out of a hundred that it would happen. Moreover it has been shown that convalescent serum even when given in large doses of 200 to 300 cc. during the preparalytic stage in monkeys does not prevent paralysis.

Zinsser and Jones state "there is no statistical proof that the serum has any value after the cells of the nervous system are involved." They also assert the involvement occurs so early in the course of the disease that "it is impossible to administer serume in time to do good."

With such thoughts in mind we are often perplexed regarding what action to take when considering serum treatment. But notwithstanding a feeling of uncertainty in respect to the value of convalescent poliomyelitis serum I believe it advisable to use it until something better is provided. When administering serum it should be given intravenously—never intraspinally. By the latter route it may do actual harm by irritating and increasing edema of the cord. When serum is used it should, of course, be injected as early as possible in the course of the disease.

In our series 28.7 per cent. of the patients received convalescent poliomyelitis serum. The dosage ranged from 60 cc. to 400 cc. and was given intravenously. Very few of these patients were treated with less than 100 cc. In some instances marked response to this form of therapy seemed manifest as indicated by a remission of temperature and an apparent improvement in the general condition. Nevertheless, I have seen similar changes for the better take place when no serum was available for the patient.

There is probably nothing more necessary in the treatment of poliomyelitis than absolute rest in bed. The average patient is nearly always better by the end of a week than he was when the diagnosis was made. In most instances whatever paralysis the patient is going to have that extent of paralysis will be present when the physician is first called. Patients with a progressive type of paralysis are the exception. After the first week of the acute stage the tendency is generally toward improvement. How much improvement will occur can only be told with the lapse of time.

Next in importance to complete rest for the patient is the prevention of deformities. Appropriate splints should be used early and the services of an orthopedic surgeon secured.

The after-care of the patient should be directed entirely by the orthopedic surgeon assisted by nurses trained in this particular field of work. The Visiting Nurse Association of Chicago with its specially trained nurses is an outstanding example of the great good that can be accomplished in the after-care of poliomyelitis for those who need and are entitled to such assistance.

In the Los Angeles epidemic[3] of 1930 the number of complete recoveries was given as 60.9 per cent. and the death rate 3.16 per cent. Both of these figures compare very favorably with many that have been reported. In our hospital series of 139 there were 13 deaths or a fatality rate of 9.2 per cent. This figure seems high but in any epidemic the mortality is dependent on the type of the disease that prevails. In the New York epidemic of 1931 the mortality was 12.2 per cent. Also it is a significant fact that of the untreated cases studied in the early "preparalytic" stages the mortality rate was less than 1 per cent. according to Park. Of our 13 fatal cases 11 were bulbar. Recovery took place in five patients of this type. Eleven of the fatal cases were males and 2 females. Of the 13 deaths 11 occurred within 48 hours of admission to the hospital.

On the basis of population, mortality for poliomyelitis is nearly always exceeded by such common contagious diseases as diphtheria, scarlet fever, whooping cough and even epidemic meningitis which does not as a rule occur with any greater frequency than poliomyelitis. In our own state last year, according to the Illinois State Department of Health the foregoing situation was shown to be true.

*Comment.*—There is no reliable method for the prevention of poliomyelitis. There is no form of serum whose efficiency has been proved in treating the patient during the acute stage.

Hospitalization is advisable for purposes of isolation and treatment.

Rest is imperative during the acute stage and is often essential for prolonged periods.

Appropriate means for the prevention of deformities is of the utmost importance in every case no matter how slight the paralysis may seem to be.

After-care is often of as great consequence to the patient as is early diagnosis.

The services of an orthopedic surgeon should be available for every poliomyelitic patient.

In the past 20 years scientific investigation has produced nothing of practical value in the prevention or treatment of poliomyelitis.

May 19, 1937.

## REFERENCES

1. Hoyne, A. L.: Poliomyelitis, With Some Observations on Thirty Cases. J. A. M. A., 67: 666, 1916.

2. Brodie, M.: The Role of Convalescent Serum in Preparalytic Poliomyelitis. J. Immunology, 28: 353, 1935.

3. Meals, R. A.; Hauser, V. F. and Bower, A. G.: Poliomyelitis—The Los Angeles Epidemic of 1934; J. Cal. and West. Med., 43: 123 and 215, 1935.

## DISCUSSION

Dr. J. J. McShane, Springfield: I congratulate Doctor Hoyne on his poliomyelitis paper. I am sure we have all enjoyed the paper; however, there are a few points that I would like to discuss. Since Doctor Hoyne has only given figures on the occurrence of poliomyelitis in Chicago, I thought it would be of interest to give not only state totals but also figures relating to Chicago and downstate. It is of interest to know that since 1916 we have had five large epidemics of poliomyelitis, the first occurring in 1917 in which there were 853 cases, 551 in Chicago and 302 downstate. The next epidemic occurred in 1921, showing 671 cases reported for the state, 135 Chicago and 536 for downstate. In 1927 480 cases were reported for the state, 148 for Chicago and 332 for downstate. Then in 1931 which was the next largest year following the 1917 epidemic, 170 cases were reported for Chicago and 530 for downstate, totaling 700 for the state. In 1936, our next epidemic, 689 cases were reported, 241 for Chicago and 448 downstate.

You will note from the above figures, that the poliomyelitis epidemic occurred every five years since 1917 and as stated by Doctor Hoyne, many more cases since 1917 occurred downstate than in Chicago with the exception of 1917.

### POLIOMYELITIS

| Year | State | Chicago | Downstate | Fatality Rate |
|---|---|---|---|---|
| 1917 | 853 | 551 | 302 | 27.6% |
| 1921 | 671 | 135 | 536 | 22.2% |
| 1927 | 480 | 148 | 332 | 21.4% |
| 1931 | 700 | 170 | 530 | 15. % |
| 1936 | 689 | 241 | 448 | 10.1% |

It might also be of interest to note the age groupings of cases during the past year of 1936 and also the paralysis that was noted among the cases reported:

### OUTSIDE OF CHICAGO / CHICAGO

| Male: | 261 | AGE GROUPINGS | | AGE GROUPINGS | |
|---|---|---|---|---|---|
| Female: | 190 | Under one year | 11 | Under one year | 8 |
| | | 1 year | 20 | 1- 4 years | 74 |
| White: | 448 | 2 years | 34 | 5- 9 years | 89 |
| Black: | 3 | 3 years | 34 | 10-14 years | 42 |
| | | 4 years | 31 | 15-19 years | 14 |
| Male: | 135 | 5- 9 years | 161 | 20 29 years | 9 |
| Female: | 106 | 10-15 years | 91 | 30-39 years | 6 |
| | | 15-19 years | 38 | 40-49 years | 1 |
| White: | 233 | 20-24 years | 10 | | |
| Black: | 8 | 25-34 years | 15 | | |
| | | 35-44 years | 5 | | |
| | | 45-54 years | 1 | | |

For the past two years the state furnished convalescence serum to physicians who desired the same for the non-paralytic cases. Out of 350 persons attendng the clinics, 323 were bled and 27, for special reasons, were not.

The number of cubic centimeteres of blood collected was 98,995 and the number of cubic centimetres of serum recovered was 37,995.

Analysis of the poliomyelitis cases in 1936 which were followed up were as follows:

### POLIOMYELITIS REPORTED: 1936

| MONTH | TOTAL CASES |
|---|---|
| January | 4 |
| February | 1 |
| March | 5 |
| April | 1 |
| May | 2 |
| June | 13 |
| July | 28 |
| August | 60 |
| September | 240 |
| October | 255 |
| November | 70 |
| December | 13 |
| Total | 692 |

### SITE OF PARALYSIS IN POLIOMYELITIS CASES REPORTED: 1936

| | | | |
|---|---|---|---|
| Both legs | 73 | Both arms | 11 |
| Left leg | 48 | Neck | 15 |
| Right leg | 51 | (includes 1 right arm, 3 right leg and 1 left arm) | |
| Left arm | 28 | | |
| Both legs and arms | 26 | Left arm and right leg | 2 |
| Right arm | 21 | Right arm and both legs | 2 |
| Right leg and arm | 11 | Right arm and left leg | 4 |
| Left leg and arm | 11 | Left foot | 6 |
| Throat | 9 | Face | 6 |
| Throat and other (includes 1 both arms, 1 both legs and 1 left arm) | 3 | Respiratory | 1 |
| | | Miscellaneous | 7 |

Dr. Archibald L. Hoyne, Chicago: Dr. McShane's figures agree very closely with what I have said regarding the subject of convalescent serum. I attempted to make the point, but perhaps didn't emphasize it sufficiently, that it seems absolutely wrong and bad from many standpoints to lead the public to believe that convalescent poliomyelitis serum will prevent the development of paralysis if administered immediately after the first symptoms of the disease. Frequently such an opinion is held.

When a physician is called to see a child suffering from a slight headache and perhaps a gastro-intestinal attack he is not likely to consider the possibility

of poliomyelitis if there are no known cases of this disease in the community. However, he may return two or three days later and find his patient has a paralyzed extremity. Under such circumstances the patient's family is sometimes incensed and feel they are justified in considering some legal action against their medical advisor for his failure to adopt the proper means for preventing the occurrence of paralysis. On several occasions I have known of parents who indicated their loss of confidence in the family physician because he did not administer convalescent serum prior to the development of paralysis.

Brode and several others have shown very clearly in experimental work that even within five minutes after an animal is injected with poliomyelitis virus large doses of convalescent poliomyelitis serum do not prevent the occurrence of paralysis. Moreover if we admit that all poliomyelitis patients do not have paralysis then we must also grant that there is not sufficient evidence to prove that convalescent serum will prevent paralysis after symptoms of the disease appear. Furthermore if it is possible to have a systemic phase of the disease without any involvement of the central nervous system then a lumbar puncture and an examination of the spinal fluid under such circumstances would disclose no abnormality and consequently be of no value in establishing a diagnosis.

Although convalescent poliomyelitis serum has been used much more extensively than it was twenty years ago, some of the views concerning its value are not altogether different. In 1917 Amoss and Chesney at the Rockefeller Institute treated a group of 26 patients with convalescent polio serum. They pointed out that to obtain the best results serum should be given prior to the development of paralysis. As I recall their report there were two instances among their group of patients in which the diagnosis was made by spinal fluid examination in the so-called pre-paralytic stage. Strange to relate these two patients who were given convalescent serum before the appearance of paralysis not only developed paralysis but had respiratory cases and were the only two in the group of twenty-six that died. Nevertheless the conclusion of Amoss and Chesney was at that time that convalescent poliomyelitis serum was the only therapeutic agent that offered any hope.

It seems to me that every poliomyelitis patient should receive convalescent serum since we have nothing better to offer at the present time, yet it does not seem proper to promise great efficiency for it nor to claim that any improvement a patient makes is due solely to the serum treatment.

Mortality figures in poliomyelitis epidemics may mean very little as indicators of successful forms of treatment. High death rates usualy mean that the percentage of respiratory and bulbar types is unusually high. When discussing the value of convalescent serum such types cannot be excluded from mortality figures on the theory that no claim is made that convalescent serum will save them. Nor is one justified when discussing any form of treatment for poliomyelitis to assert that certain patients died because there was not sufficient time to treat them. Such reasoning in discussing the value of any therapeutic agent is far from convincing. If all deaths are excluded from any series of patients regardless of the basis on which the action is taken the fatality rate will be nothing. Notwithstanding such thoughts as have been expressed it seems to me we should afford poliomyelitis patients any possible benefits which may be derived from the administration of convalescent serum.

Dr. Paul H. Harmon, Chicago: I would like to add some information to the scientific facts that Dr. Hoyne did not bring out. Schultz and Gebhardt in California found, if serum was given at the same time or shortly after inoculation with the virus into monkeys, there was a lessened mortality and a lessened incidence of paralysis in those protected with serum in comparison to untreated controls. In the protected group of monkeys there were 30% survivals as compared to only 7% in those that had not had serum. Then, too, the treatment of human beings is entirely different from the treatment or protection of monkeys because of the fact that the disease is milder in man. In monkeys inoculated with passage virus the incidence of paralysis and death is nearly 80 or 85%, whereas in man even in untreated cases the mortality rate is very low (5 to 10%). Dr. Levinson has had an extensive experience with the treatment of the human disease. I think he would like to discuss the treatment of human cases with convalescent serum. We have performed some experiments which I would like to present.

On some of Dr. Hoyne's cases this past summer we took rectal and nasal washings in order to test these for virus. Of twenty such patients there were five from whom we were able to recover the virus from the gastrointestinal tract. This evidence, taken with the lack of changes in olfactory bulbs from fatal cases of this diseases, led us to believe at least in the 1936 epidemic in Chicago that the disease probably was a gastrointestinal infection.

There is a reason why serum is not of great value in preventing the disease: the presence of neutralizing substances against the virus in the blood prior to onset of paralysis. If one is so fortunate as to see a preparalytic patient and obtain blood from him before serum is given, one finds that at least 50 to 60% of such patients have virus-neutralizing substances in the blood before paralysis sets in.

Debatable as is the question of treating the acute disease with serum, the orthopedic treatment of supporting neck and paralyzed extremities is easily shown to be of value. Support by splints or other apparatus should be applied as soon as weakness is detected.

Dr. Sidney O. Levinson, Chicago: Although the time hardly permits further discussion, I feel that this very serious indictment of the value of convalescent serum therapy requires a reply.

There has been much recent quibbling over the term "preparalytic." The important word is "poli-

omyelitis." The adjective only serves to classify a case acording to the clinical stage. The term "non-paralytic" cannot be employed during the acute stage; it may only be used when the disease has subsided and the patient has made a complete recovery.

Your attention has been called to the 20% incidence of paralysis when no serum treatment was used. In a report by Harmon there was an average of 28.5% paralysis developing in 531 untreated cases collected from the literature. Please keep in mind this figure of 28.5% paralysis rate in untreated cases.

The essayist reported today that 16 preparalytic patients were treated with convalescent serum at the Municipal Contagious Disease Hospital in 1936. The outcome of these cases is worthy of note. All 16 made complete recoveries without residual weakness. Such excellent results only reflect a more general experience.

I want to call your attention to two reports in the recent literature. Cowie and others in Detroit used large doses of serum or transfussions in 85 consecutive preparalytic cases with complete recovery. Jensen in the Danish epidemic used large and repeated doses of serum with a resulting low total incidence of paralysis. Our work in the Chicago area in the last six years, treating more than two hundred consecutive preparalytic cases, shows an incidence of paralysis of less than 2%. Compare these three reports of serum treated results with the previously quoted 28.5% paralysis rate in non serum treated cases.

I can appreciate the stand Dr. Hoyne adopts that the value of convalescent serum has not been proven. But is there justification for the statement that serum therapy is worthless and even harmful? A careful alternate case study has never been reported. I should like to see Dr. Hoyne go further and make such an alternate case study. This would go far to settle the dispute. Those of us, who have secured excellent clinical results from serum therapy, cannot give up the only measure available at the present time.

Dr. Archibald L. Hoyne, Chicago: Dr. Levinson seems to attribute to me a statement that does not appear in my paper; nor have you heard me say at any point in my comments that "serum therapy is worthless and even harmful."

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## ADVICE TO PROSPECTIVE MOTHERS

"Prospective mothers are like athletes in training for an important event. They should live according to the rules to assure a well baby and a healthy mother. Approved diet contains nourishment for the mother and materials for building the body of the baby. Starches, fats, vitamins and minerals, with plenty of milk, leafy vegetables, whole wheat bread and restricted amounts of meat are recommendations often made. Women who are to be properly prepared for motherhood should have the care and advice of a physician throughout the period, and for several weeks after the baby is born."

## SURGICAL MANAGEMENT OF ACUTE APPENDICITIS AND ITS COMPLICATIONS IN CHILDREN

EDWIN M. MILLER, M. D.
EDGAR C. TURNER, M. D.
CHICAGO

Probaby no subject in the field of Surgery has been more widely discussed during the past fifty years than that of the treatment of appendicitis and its complications. During the past few years considerable progress has been made due largely to very careful studies of large series of cases, especially those from the university clinics, notably those of the Mid-Western states.

In an effort to clarify the indications for operative interference Doctor Turner and I have tried, during the past three years, to make a careful clinical study of those cases of acute appendicitis and its complications which have been cared for at the Children's Ward of the Cook County Hospital. We submit here the results of our investigation for your consideration.

It has been our observation for a number of years that these cases fall naturally into three clinical groups which, from their histories and physical findings, are as a rule readily distinguishable one from another.

Group 1: This group comprises all those acute cases which, from their histories and physical findings, are evidently those of acute appendicitis before the stage of perforation.

As to the proper treatment of this group there is practically no difference of opinion at the present time. All of these in our series have been subjected to immediate operation, except those in which the infection was very clearly in the subsiding stage when they entered the hospital. There has been no mortality in this group.

Group 2: This group represents those cases which, when first seen by the physician or surgeon, both from the history of longer duration and the physical finding of a localized palpable inflammatory mass are quite clearly cases of perforation against which there has been set up from the start an adequate defensive mechanism. This inflammatory mass, or so-called "appendical abscess," may vary greatly in size—being at times as large as a small orange—and may occupy any

Read before Joint Session of Medicine, Surgery & Radiology of the Illinois State Medical Society, Peoria, May 19, 1937.

position in the right side of the abdomen. Not infrequently it is felt even in the left lower quadrant. At times it is recognizable wide in the flank, at other times deep in the pelvis, and can often be made out only by rectal or bimanual examination with the patient well relaxed.

It has been our feeling that this type of case had best be handled very conservatively, and our experience in this study amply justifies this point, because in most instances (fully ninety per cent. of cases) careful observation of this type of patient over a period of days with conservative management will show a gradual improvement—a gradual reduction in fever and leukocyte count, a diminution in size of the palpable inflammatory mass, and at the end of ten days to four or five weeks the complete disappearance of the abnormal physical findings. This type of patient is routinely advised to return for appendectomy during a quiet period three or four months later when the appendix may be removed without fear of mortality no matter how densely imbedded in adhesions it may be found.

Only a few cases in this second group take the opposite course, in which the clinical symptoms become progressively more marked and the size of the mass progressively increases to the stage where it apparently tries to point either anteriory, laterally, or deeper in the pelvis. Under these conditions it is apparent that an appendical abscess of considerable size is present and simple drainage through a small incision, through what amounts practically to an extraperitoneal approach, may be safely accomplished with almost no mortality rate.

Group 3: In contradistinction to the cases in Groups 1 and 2, the cases falling in Group 3 represent those of acute perforation against which, even from the start, there has not been an adequate defense mechanism. Pathologically speaking, they are as a rule of the obstruction type of appendicitis and the perforation is grossly

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**ACUTE APPENDICITIS WITHOUT PERFORATION**
**1934—1935—1936**

TOTAL NUMBER OF CASES 329
MORTALITY 0

DURATION OF SYMPTOMS

24 Hours of Less ---------- 155

24 Hours to 48 Hours ---------- 104

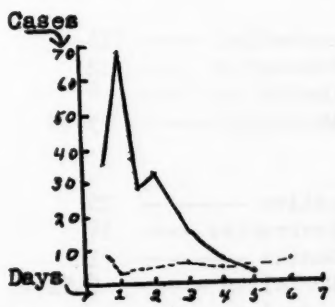
48 Hours or More ---------- 76

History of Catharsis in ---------- 77

TREATMENT

CONSERVATIVE ----- 33

IMMEDIATE OPERATION--- 296




DURATION OF SYMPTOMS (1935-1936)
------- CONSERVATIVE
——— IMMEDIATE OPERATION

of considerable size. This condition may be likened to a "blow-out" in an automobile tire in contradistinction to a slow leak as represented by a case in Group 2. Very often streptococcus is the predominant organism and very often also the patient is one whose resistance to infection is very obviously quite low. The findings on abdominal examination are generalized rather than localized. The acute general tenderness and rigidity speak for a rapidly spreading more or less general peritonitis.

The treatment in this group of cases has been for a long time a subject of wide controversy among reliable surgeons. Many of our best men feel that under these conditions the chances of recovery are greater if the patient is left alone, with the use of Fowler's position, morphine, restricted intake by mouth and whatever other conservative measures seem to be indicated at the time.

On the other hand, equally good men take exactly the opposite stand. In this point of view we most enthusiastically concur, because the evidence here presented from our experience is unmistakable. We have learned that no matter what the interval of time since the apparent onset of perforation, surgical removal of the source of the infection combined with adequate drainage, where drainage seems to be necessary, is the one most effective procedure in avoiding a fatal result. It is our opinion also that in these severe cases of perforation with spreading peritonitis the resistance of the peritoneum becomes impaired in proportion to the degree to which the blood supply to the bowel is interfered with by the distention of the bowel with gas, and that the use of the duodenal suction tube or the introduction of a catheter through the cecum or through the stump of the appendix are measures which cannot fail to contribute favorably toward a successful result.

As to the matter of drainage itself, we are not

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1934 - 1935 - 1936

ACUTE APPENDICITIS WITH PERFORATION AND

LOCALIZED PALPABLE MASS

Total Number of Cases 131
Mortality 3.8%

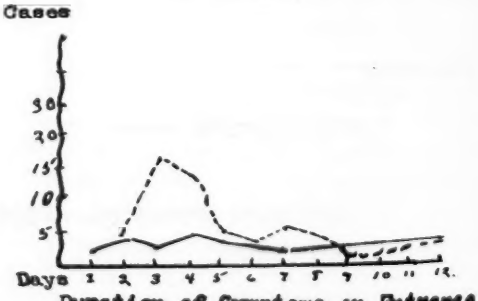
LOCATION OF PALPABLE MASS

Most often in R.L.Q. Frequently directly above symphysis, or in the true pelvis (felt by rectal examination only). Occasionally in L.L.Q. or in the right costo vertebral angle.

TREATMENT

Conservative ----- 116
Recoveries ---- 112
Deaths ------- 4
Mortality ----- 3.4%

Operative ------- 15
Recoveries ---- 14
Deaths ------- 1
Mortality ----- 6.6%
Drainage
Of Abscess Cavity --- 9
Into Peritoneum Only- 2
One Death had Appendectomy and Drainage.



prepared at present to make any definite statements because our observations on this point are insufficient. We believe, as most other surgeons do, that it is impossible to drain the infected peritoneal cavity completely by introducing tubes through an incision or through multiple incisions. Yet we continue to use drainage, always employing the soft cigarette type and always placing them as near the source of the perforation as possible. Especially do we feel that they are of value when the perforation is retrocecal in position; in other words extraperitoneal, because we feel that it may not infrequently help prevent an ascending infection along the posterior wall which might lead to a subphrenic abscess.

*Conclusions.* We feel that the observations here presented warrant the following conclusions:

1. *Immediate appendectomy is indicated in* all cases of acute appendicitis before perforation, unless the infection is very clearly subsiding.

2. *When the clinical evidence shows that the* appendix has ruptured and the infection is definitely localized as evidenced by a palpable inflammatory mass, a conservative course should be followed in the vast majority of cases. Only a very few will demand surgical drainage.

3. In all cases in which a spreading peritonitis is present without evidence of localization, *it is a wise plan to remove the source of the infection,* institute proper surgical drainage, and use whatever means available to deminish the amount of distention of the bowel with *gas.*

## CASES OF ACUTE APPENDICITIS AND COMPLICATIONS

Cook County Hospital, Ward 46
1934—1935—1936

| | No. Cases | Mortality |
|---|---|---|
| Group 1—Acute Appendicitis without Perforation | 329 | 0 |
| Group 2—Acute Appendicitis with Perforation with local Palpable Mass | 131 | 3.8% |
| Group 3—Acute Appendicitis with Perforation without local Palpable Mass | 163 | 22.7% |
| Total Number of Cases | 613 | |
| Average Mortality | | 6.8% |

1934 - 1935 - 1936

ACUTE APPENDICITIS WITH PERFORATION AND PERITONITIS

(Without local palpable mass)

Total Number of Cases 163
Mortality 22.7%

Duration of Symptoms

| | |
|---|---|
| 24 Hours or less | 31 |
| 24 Hours to 48 Hours | 65 |
| 48 Hours or More | 68 |

TREATMENT

CONSERVATIVE 21

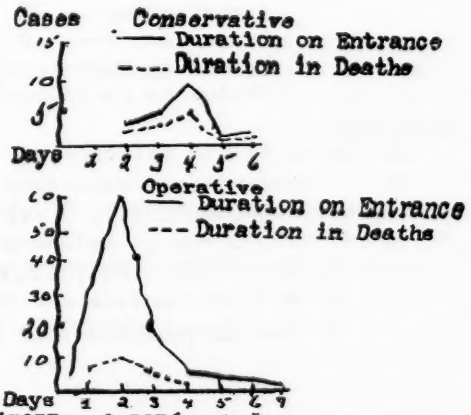
| | |
|---|---|
| Recoveries | 5 |
| Deaths | 16 |
| Mortality Rate | 76.1% |

OPERATIVE 142

| | |
|---|---|
| Recoveries | 121 |
| Deaths | 21 |
| Mortality Rate | 14.7% |

Drainage in Operative Cases

| | |
|---|---|
| None | 5 |
| To peritoneum | 4 |
| In Peritoneum | 4 |




(1935 and 1936 only)

## SUMMARY OF CASES OF ACUTE APPENDICITIS

Cook County Hospital, Ward 46

| | GROUP 1 | | | | Group 2 | | | | Group 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1934 | 1935 | 1936 | Total | 1934 | 1935 | 1936 | Total | 1934 | 1935 | 1936 | Total |
| NUMBER OF CASES | 116 | 104 | 109 | 329 | 59 | 32 | 40 | 131 | 67 | 57 | 39 | 163 |
| OPERATIVE TREATMENT | 111 | 86 | 99 | 296 | 5 | 6 | 4 | 15 | 54 | 55 | 33 | 142 |
| Recoveries | 111 | 86 | 99 | 296 | 4 | 6 | 4 | 14 | 46 | 46 | 29 | 121 |
| Deaths | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 8 | 9 | 4 | 21 |
| Mortality | 0 | 0 | 0 | 0 | 20% | 0 | 0 | 6.6% | 14% | 16% | 12% | 14% |
| CONSERVATIVE TREATMENT | 5 | 18 | 10 | 33 | 54 | 26 | 36 | 116 | 13 | 2 | 6 | 21 |
| Recoveries | 5 | 18 | 10 | 33 | 50 | 26 | 36 | 112 | 5 | 0 | 0 | 5 |
| Deaths | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 8 | 2 | 6 | 16 |
| Mortality | 0 | 0 | 0 | 0 | 7% | 0 | 0 | 3% | 61% | 100% | 100% | 76% |

## DEATHS FOLLOWING ACUTE APPENDICITIS and Its Complications

Cook County Hospital Ward 46
1934 - 1935 -1936

**Total Number of Deaths** 42 In a series of 613 cases (6.8%)

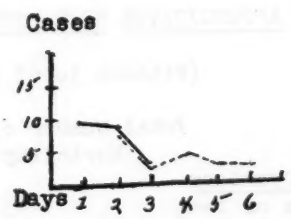
**Duration of Symptoms**

24 Hours or Less ------ 5
24 Hours to 48 Hours ---12
48 Hours or More ------24

**TREATMENT**

**Conservative** ------- 19

**Operative** ------ 22




Duration of Symptoms on Admission
---- Conservative
—— Operative

**Procedure**
Drainage only-- 2
Appendectomy -- 20
No Drains ---- 9
Drains to Peritoneum only --- 8
Drains in Peritoneal cavity - 5

**Bathology**

All cases showed evidence of Generalized Peritonitis.
In 5 cases it was secondary to a Localized Palpable Mass which ruptured spontaneously, 3 pelvic - 2 R.L.Q.
In 37 there was no evidence of localization.
1 Intestinal Obstruction (Enterostomy)
7 had Peritonitis and Broncho pneumonia
2 had thrombophlebitis and Lung Abscesses

### MIRTHOLITIS

Driver: "I wasn't going forty miles an hour, nor thirty, nor even twenty."

Judge: "Here, steady now, or you'll be backing into something."

### CLEAR ROAD AHEAD

Betty: "Do you have any green lip sticks?"

Drug Store Clerk: "Green lip sticks?"

Betty: "Yes, a railroad man is going to call on me tonight."

# THE DIFFICULTIES IN DIAGNOSIS

DARWIN KIRBY, M. D.

CHAMPAIGN, ILL.

To talk to you about diagnosis of appendicitis is like "carrying coals to New Castle." I have often said that I questioned if we ever profit from the mistakes of others; if I am right then my part in this symposium might as well have been left out. If on the other hand, some of my experiences bring out some things of interest, I will feel that I may have added a little to what I consider often a baffling problem.

The urinary tract is a villain and the pyelitis or calculus may cause an inoffensive appendix to be hailed to the seat of judgment before the pathologist, whose report "no pathology found" is to say the least displeasing to the conscientious surgeon. In fact, I have become just a little tired of continually hearing urologists tell us of our making so many mistakes along this line. Perhaps they too have a little glass in their house. Microscopic urinary examination should always be made, but certainly a few pus cells, or in a woman red cells unless a catherized specimen, does not say hands off. They do indicate an urgent need for a very painstaking examination, but if in doubt the appendix should come out.

What I am trying to say is that clinical evidence must always outweigh laboratory evidence. This naturally leads up to blood counts. Many a patient languishes in the prison of doubt while the technician helps the surgeon to make up or unmake his mind about the advisability of operating. It is no exaggeration to say that too often much valuable time is lost and that after the third count several hours following the attack the surgeon is no wiser than at first. I am not discouraging blood counts. I believe in them, especially the Schilling count and the shift to the left. This I believe is more important than the total number of white blood cells and polymorphonuclears. I operated on two cases recently where the divergence of leukocytes was extreme. One a young girl with severe pain in lower right abdomen, temperature 101, localized tenderness, slight rigidity, chest and throat negative, urine negative, WBC 37,000. A rather large innocent looking appendix was removed. The other, also in a woman about thirty with similar findings except the onset had been quite stormy and there was marked rigidity and tenderness. Vaginal examination in this case negative as was the urine, WBC 2,900, so low that before operating had another taken, this time 4,100. Bloody fluid found when the abdomen was opened, normal appendix removed. Exploration revealed an apoplexy of the right ovary where a graafian follicle had ruptured. Both cases I am sure would have gotten along without operation. In the last case, however, there were fibroids so a hysterectomy was done.

It seems that almost every known medical and surgical condition has some time been confused with appendicitis. Following is a partial list of some that have been mistaken and reported. Dietl's crisis, psoas abscess, early typhoid, luetic crisis, tetanus, abortion, influenzal myalgia, torsion of the omentum, mesenteric lymphadenitis, amebic dpsentery, intestinal allergy, coltis, tonsillitis and scarlet fever, diverticulitis, malaria, purpura, acute pancreatitis, perforated duodenal and gastric ulcer, internal hernia, ectopic pregnancy, endocarditis and pericarditis, rheumatic fever, urethritis and poleomyelitis. As mentioned above, this only covers a few of the multitude of conditions which have been diagnosed as appendicitis. What is the explanation? The only answer, I think, is gastrointestinal symptoms with pain and perhaps some tenderness. I wish some one would explain why all of the referred pain goes to the right lower quadrant rather than the left. I sometimes suspect it is because we push harder on that side. That not careful enough examination is made in many cases is illustrated by what a prominent surgeon said a few years ago, that he was kept busy saying no.

I have tried to school myself to think of everything that can cause abdominal pain when examining a case which presents gastrointestinal symptoms. This, while no doubt praiseworthy, has not helped me much in the diagnosis of appendicitis, but has in a few instances kept me from doing an unnecessary operation. I was called to see a young lad sixteen years old who gave no history except sore throat and vomiting, temperature 102, pulse 110, moderate leukocytosis, urine negative chemically and microscopically. There was no eruption to explain a scarlet and the throat was not typical and while red, did

Read before Joint Session of Sections on Medicine, Surgery & Radiology, Illinois State Medical Society, Peoria, May 19, 1937.

not seem sufficiently inflamed to explain the symptoms. Examination was essentially negative and I went to considerabe pains in making a rather complete physical examination because the lad was evidently quite ill and neither symptoms nor findings were very helpful. This was about 1 P. M., about 6 P. M. the nurse phoned me that the patient was having severe abdominal pain. I hurried to the hospital and the first thing I did was to feel his abdomen, this was quite rigid.

I reviewed the history, no help there. Suspecting the possibility of a referred pain I quizzed carefully about a cold, chills or cough, none. Nothing but a sore throat and I did not consider the throat findings sufficient. Another physical examination; the abdomen definitely rigid more so on the right side and tender on pressure which seemed more marked in the lower right quadrant. Was there anything in the abdomen on my first examination? Here is where I received some mental kicking. I remembered the left side because I had felt for a spleen, but I could not remember the right side. From now on I do. Whether to operate or not. Consultation was called, but no great light was shed and besides the responsibility was mine. Another careful examination, this time I felt rather sure that the breath sounds were not entering the lower right lobe as well as the left, but no dullness and no rales. Decided that I had a central pneumonia with referred pain and did not operate. Next day a few rales and later a typical lobar pneumonia.

My most distressing mistakes have been made where I have operated on cases which later proved to be renal conditions and in women and girls where the pathology proved to be in the pelvis. One can, however, learn too well from his own mistakes. I will not soon forget a woman about forty complaining of abdominal pain quite low down in the pelvis, slight nausea, but no vomiting. Temperature around 100. Examination showed tenderness in lower abdomen more marked on right side but very low. Vaginal examination disclosed tenderness in right adenexa, the urine was negative. I explained to the patient and family the difference between appendicitis and salpingitis and told them that we did not operate on acute pelvic infections. Rest in bed and hot applications ordered. Next day patient seemed better, no temperature and pain less. Same treatment continued. Further care discussed and possibility of operation later remarked about. This came earlier than expected. About one week from the time of my first visit, I received a hurry up call to this patient and found her in a serious condition with evidence of peritonitis. Rushed her to hospital and found a ruptured appendix which was mixed up with the right tube and ovary. All three were removed. Fortunately she made a good recovery.

Not so long after this I operated on a similar case where the trouble was definitely in the tube. I do not know just where this leaves me. The last case was relatively easy, definitely a chronic salpingitis and the pathology only being similar, that is all three organs were in one mass. Perhaps the mistake I made in the first case could have been avoided if I had taken more time in getting a careful history.

I believe we do not go into history taking as carefully as we should. The previous history of other attacks may help, and in the present complaint try to get the sequence of events, especially the time element. When did pain come on, before or after nausea or vomiting? With a little care we can sometimes find that the patient will help us if we will give them a chance and not rush too hurriedy to the physical examination. This is especially true in referred pain from the chest and kidneys. I often wonder how many appendices are removed where the underlying cause is an old leutic infection.

The difficulties in diagnosis are not always over when the abdomen is opened, which brings me to my pet pieve, the 1½ inch gridiron incision. How can you explore the stomach, gall bladder and pelvis through a finger opening. The best example of this I think is in the case of Dr. Charles Mayo who was operated on one day for appendicitis and the next day for gall bladder disease. Another thing, you cannot say that the appendix is guilty until caught and I have removed it from the region of the liver while the gall bladder played back and forth above. One time I found it attached to the urinary bladder. One time my assistant, a capable surgeon, and myself spent about an hour before I located it at the left side of Douglas' pouch with all of the ascending colon. There was no colon; nothing but small intestines in the right side. So the difficulties in diagnosis may persist after the abdomen is opened.

When all is said and done, all the history,

physical examinations and laboratory tests in, there is one thing that I place more confidence in than anything else, that is the localized tenderness. I will never forget a young woman who complained of abdominal distress, some nausea, but no vomiting, temperature and pulse normal, WBC normal, urine negative. On deep pressure some tenderness. Operation decided upon and a gangrenous retroceceal appendix removed. And in those cases which present difficulty, may I suggest that we never forget the rectal examination.

In reviewing the recent literature on this subject, I found what I consider the best cross section of opinion as expressed by Knut H. Giertz, Stockholm, who in speaking of appendicitis says: "When we urge early operation we imply early and exact diagnosis; without such we come to slaughter 'en masse' or to extirpation of appendices for reasons other than the patient's health and safety. However experienced we become in the course of years and however conscientious we are in our obseravtions, we have to face almost daily patients with acute abdominal pain on whom we are unable to make an exact diagnosis and in whom we are unable to exclude the possibility of appendicitis. In such cases, I perform on principle, an exploratory laparotomy over the appendiceal region."

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# THE RADIOLOGICAL APPENDIX

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A survey of the literature reveals no scarcity of articles on this subject and we shall not endeavor to correlate all that has been written. The subject is not new and the following presentation is mainly that based on our own experience.

From the Roentgen Departments of the Chicago Memorial Hospital and Michael Heese Hospital, respectively.
Read before Joint Session of Medicine, Surgery & Radiology, Illinois State Medical Society, Peoria, May 19, 1937.

Since 1906, when Beclere first recorded the x-ray visualization of the appendix, much has been written with special reference to its significance. He was followed by George and Gerber, Pfahler, Cushway and Maier, Skinner, Pancoast, and a host of others to date, too numerous to mention. The subject, however, is still controversial, and therefore we take this occasion to restate the roentgenological aspect.

Meticulous care must be employed by the radiologist, in order to procure the best results from the examination. Two methods of approach are open. The first, and the method of choice, consists of giving barium orally and examining the entire gastrointestinal tract; and the second, by utilizing the barium enema. Both methods will be briefly discussed.

*Oral method.* The patient is given a barium meal, and its passage carefuly noted through the esophagus, stomach, duodenum, jejunum, ileum and colon, with interval examinations at two, four, six and eight hours, or until the barium has advanced well into the colon, and then at twenty-four and forty-eight hours. These time limits are arbitrarily stated, but may have to be varied considerably, depending on the type of barium meal used and the rate of progress of the head of the barium column through the intestinal tract, due to reflex irritability, gastritis, enteritis, etc. Obviously, considerable upper intestinal pathology may be discovered before the appendix is reached, and this may be of considerable import in the final analysis of the case. Coexisting pathology is rather common and in this regard we also recommend a thorough study of the gall bladder in practically all cases. Deviations from the foregoing routine naturally will result from the clinical aspect of the case, but in general we recommend a complete study of the gastrointestinal tract. It is, likewise, very important to observe the small intestines for evidence of regional ileitis, of which much has been written of late.

The normal appendix usually fills and empties with the cecum. The chronic appendix either fails to fill by virtue of occlusion, or to empty by virtue of its atonicity or chronic inflammation, while kinks or adhesions may inhibit the peristaltic action and produce stasis. Upon stasis, along with the fluoroscopic and radiologic evidence, rests in part the determination of its chronicity. An appendix which remains filled for

three or four days after the entire colon has been evacuated in our experience strongly suggests pathology. It is not so unusual to find barium retention in the appendix two to three weeks after examination. Various authors, however, maintain that the mere retention of barium in the appendix is no sign of its being pathological. We find no good physiologic reason for supporting this contention. Holzknecht, Case, Rieder, Cohn, George, Imbogen and many others, have written extensively on stagnation of bismuth in the appendix as a sign of chronic appendicitis. Carman and Case lay much stress on ileocecal stasis. Here, again, we cannot concur.

A nonfilling appendix does not necessarily signify obliteration of its lumen. It may fail to fill by virtue of obliteration, or because the appendix already contains fecal material which prevents the entrance of the contrast media. Repeated examinations at various time intervals may disclose, as at the forty-eight hour period, a visible appendix which may not have been revealed before. A nonfilling appendix, with a history of repeated attacks of lower right quadrant pain and associated clinical findings, and the Roentgen findings of cecal tenderness over the anatomical region of the base of the appendix, right rectus rigidity and fixation, are very significant.

In our perusal of a vast amount of literature on the subject of the chronic appendix from 1906 to the present day, all agree, with few exceptions, that the Roentgen signs of chronic appendicitis are fixation of the appendix, hypertonus, persistent barium stasis after the colon has emptied, and the point of maximum tenderness agreeing with the position of the appendix.

*Opaque enema.* This method, as a rule, is unsatisfactory, often resulting in reflex spasm and apparent irritability, due to an unphysiologic procedure, and, as is too often the case, the appendix fails to fill with contrast media. Palpation is difficult to evaluate, as the patient is usually uncomfortable and distressed and pain points are invariably unreliable. However, when, by this method, an appendix is visualized, we feel that it is potentially pathological. In any event, sufficient barium should be used to overcome the resistance of the ileocecal valve, in order to fill at least the terminal ileum. This is important to determine the presence or absence of terminal ileitis.

### X-RAY FINDINGS

*Visibility.* The appendix may be visualized in over 80% of all cases, whether normal or pathological. Filling or nonfilling, per se, is in itself no positive proof of disturbed physiology or disturbed function. When visualized, consideration must be given to the size, shape and location, whether segmented, bulbular or kinked. A bulbular tip or a kinked appendix is strong presumptive evidence of disease, and at times it may even be possible to demonstrate fecoliths in the bulbar end. At other times only the base of the appendix may be visualized, due to an obliterated lumen beyond.

*Position.* The normal appendix has been described as occupying a position with the base of the appendix at McBurney's point. In our experience, and that of others, there is no constant position for the appendix. It naturally varies, in the normal, ranging from above the iliac crest to and in the true pelvis, depending upon physical type and posture. A pathological appendix, however, may be adherent in the gall bladder area, be fixed in the pelvis, may lie in the midline or to the right of the cecum and ascending colon, or retrocecal. The atypically located appendix must be demonstrated to remain in this position at all times, before one can logically consider that it is adherent. This is especially true when the appendix is shown to be fixed in the female pelvis. The cecum and appendix may be impacted in the pelvis and be impossible to manipulate. Before one can conclude that this fixation is positive, the patient must be examined at twenty-four and forty-eight hours, and with the opaque enema, in order to balloon out the ampulla recti, which often is sufficient to release the impacted appendix and cecum from their position in the pelvis so that the appendix then can be palpated freely up into the iliac fossa and its pathology evaluated. A mobile appendix, likewise, does not rule out periappendiceal adhesions, as the appendix may not be fixed to the peritoneum, but may be adherent to the cecum or terminal ileum, mesentery or omentum, all of which structures in themselves may be mobile, yet the appendix may be bound to these structures by adhesions.

*Tenderness.* Pain elicitated on palpation directly over the appendix must be accurately determined, as its clinical significance is of the greatest value. The appendix may be so mobile

that it may be impossible to impinge it between the palpating finger and the iliac fossa. It frequently occurs that pain over the appendix is in no way associated with McBurney's point. Mobility of the appendix often necessitates fixing of the appendix with the fingers of one hand, under fluoroscopic observation, while palpating with the other Pain on palpation over the appendix, which shifts with a change in position of the appendix, is of extreme importance. Palpation over the appendix, likewise, may produce—and frequently does—simultaneous pain elsewhere, such as in the gall bladder area, the epigastrium, the left iliac fossa, and around the navel. Right rectus rigidity is a clinical sign of great significance, and especially so when produced under the fluoroscope, with full knowledge that the palpating finger impinges the appendix and elicits the rigidity. An involuntary muscular defense reaction is also of extreme importance, especially when associated with palpation of the appendix when accurately located on the fluoroscopic screen. When the appendix lies in the pelvis, it is often extremely difficult, or impossible, to palpate satisfactorily for tenderness or fixation. In the female, palpation of the appendix in the pelvis must be cautiously differentiated from right adnexal pathology.

*Colon.* Secondary signs often associated with a pathological appendix are those of a tender cecum, ascending colon, and left iliac colon. To these must be added secondary colitis, colon spasm, ileocecal incompetency and ileal stasis. Pylorospasm may also be produced, however, we agree with Carman, who states, "The direct findings are usually so definite that we need not put much weight on indirect signs."

*Discussion.* We have purposely omitted a resumé of the clinical findings, since this portion of the symposium is to be taken up by the surgeon and the internist. Regardless of the satisfactory results in the Ioentgen conclusions per se, we wish to make ourselves clear that in no wise do we infer that the clinical findings shall be omitted. In fact, we always insist that these must be included in the final summation of the case. We would also like to stress that the entire gastrointestinal tract be examined in every case, rather than just the appendix. It is a well established fact that there are many coexisting abdominal lesions, such as ulcer, gall bladder and appendix. It has been shown that in only about 60% of all cases, in which pathological conditions occur in the abdomen, only one demonstrable lesion was present, while 40% showed combined lesions.

Johnson demonstrated that in 45 out of 100 cholecystectomies the appendix was involved, and Soper reports that 41.5% of 411 cases disclosed definite relationship to other infectious processes in the gastrointestinal tract. It has been further demonstrated that there is a direct anatomical physiologic relationship between the gall bladder, the duodenum and the appendix, so that an infectious process starting at any one of these points may involve the other two. We, therefore, strongly urge that complete gastrointestinal roentgenologic examinations be made in all cases in which there is a history of abdominal disease. Where the financial status of the patient is such that he cannot afford additional expense, the examination should be carried on by the radiologist, regardless, as it is to the best interest and welfare of the patient that this be done, in order to elicit the entire pathological picture. This and this only should satisfy the physician or surgeon.

From the standpoint of differential diagnosis, from the Roentgen viewpoint, all of the following possibilities must be borne in mind and each in turn eliminated:

Duodenal ulcer; duodenitis; gallstones; hydrops of the gall bladder; hydronephrosis of the right kidney; right kidney stone; right kidney ptosis; ptosis of the colon; diverticulosis; colitis; tuberculosis of the cecum; terminal or regional iletitis; carcinoma of the cecum; right female adnexal pathology in which pneumoperitoneum or uretero-tubography may be necessary; sacroiliac arthritis. In consequence of the differential points necessary to a diagnosis, one cannot refrain from again stressing the necessity of instituting a thorough, meticulous, painstaking x-ray investigation.

While statistical figures are boresome, it is worthy of note that Feldman, whose recent contribution to the literature on this subject likewise stresses what we have attempted herein, the necessity for thorough, competent x-ray examination, since in his series of 115 cases of so-called chronic appendicitis in which unsuccessful surgical results were obtained, revealed of the more common findings in three series of cases the fol-

lowing: gastric and duodenal ulcer 36.5%; gall bladder pathology 26.5%; genito-urinary pathology 6.0%. While it cannot be said that there was no coexisting appendiceal pathology, these statistics clearly indicate that there were other x-ray evidences in a large proportion which accounted for gastrointestinal disturbances.

It is our opinion that the percentage value of the determination of a diseased appendix, from the radiological viewpoint, is as high as the x-ray determination of the presence of duodenal ulcer. Clinical, surgical and pathological check-ups over a large series of cases, including series of others, confirm this statement. Too often reliance is placed upon the pathologist's report which may indicate a normal appendix on section. However, we must bear in mind that the pathologist reports his sections as he sees them and does not record symptomatology in retrospect. A careful evaluation must be made of the pathological findings, but the ultimate criteria must rest upon the clinical progress of the case.

*Summary.* In every case of suspected chronic appendicitis, a painstaking Roentgen examination of the entire gastrointestinal tract is indicated. This includes stomach, duodenum, small intestine and colon. We likewise feel that in no case should the gall bladder be omitted, and cholecystography should be carried out as a routine in every case. It may be necessary further, to include the genitourinary tract, either by means of scout films, excretion urography, or retrograde pyelography. In the female, often uretero-tubographic examinations with combined uretero-salpynogography and pneumoperitoneum may be indicated.

The differential diagnosis of chronic appendicitis is almost impossible without the aid of a satisfactory roentgenologic study, by which means a large number of conditions producing gastrointestinal symptoms, which may closely simulate appendiceal pathology, may be ascertained or ruled out.

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# DIAGNOSIS OF ACUTE APPENDICITIS IN CHILDREN

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Abdominal pain and distress together with gastrointestinal symptoms are extremely common in infants and children. Although the incidence of acute appendicitis is comparatively low the possibility of the latter should always receive serious consideration. The seriousness of acute appendicitis may be said to be inversely proportionate to the age of the child. In the younger ones, perforation and peritonitis develop rapidly.

The diagnosis of acute appendicitis is one of the most difficult and important problems encountered in the practice of medicine among children.

Statistical studies show that 50% of all cases of appendicitis occur during the first twenty years of life, and of these, 2.5% occur in the first 5 years, 6% between 6 and 10 years, and 16.5% between 10 and 15 years, and the remaining 25% between 15 and 20 years.

There seems to be a slight seasonal variation with the increase occurring during the summer months, due to the prevalence of gastroenteritis at this time.

The symptoms and signs in the first 5 year period differ distinctly from those in the older groups and will be considered separately. This group is also deserving of special mention be-

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cause of the high mortality, being eight to ten times greater than that in the 5 to 15 year group, and is due chiefly to the delay in diagnosis and the rapidity with which peritonitis develops. In a large series, 90% were found to have peritoneal involvement at operation. Cooperation and information are difficult to obtain in the younger child and the physical findings are indefinite until peritoneal irritation and perforation occur.

Generalized symptoms and behavior are more diagnostic than local findings. Severe illnesses in infants are not associated with restlessness, and when a child is restless, unable to sleep, cries a great deal, exhibits a pallor and assumes a typical posture while lying in bed with the right leg flexed on the abdomen, and has increased costal type of breathing, one may well consider appendicitis as the cause. Vomiting is quite a constant symptom and occurs soon after the onset of pain. The bowels may be normal or constipated. The temperature is rarely elevated higher than 101 degrees, and the leucocyte count, which may be of diagnostic importance, rarely exceeds 20,000.

In the differential diagnosis, one may consider intussusception, but the distinct suddenness of onset of pain, the shock as evidenced by pallor and clammy perspiration, together with the relaxed abdomen and the findings of a sausage like tumor and the currant jelly like bloody mucus obtained on rectal examination, will, in most cases, establish this diagnosis.

Acute mesenteric lymphadenitis cannot be accurately differentiated from acute appendicitis although the tenderness is usually less than the pain experienced by the patient. The process may or may not involve the appendix and it may be well to make the diagnosis of appendicitis in lymphadenitis rather than to consider a lymphadenitis as such and later find signs of a ruptured appendix.

In certain cases of hypertrophic pyloric stenosis the onset may be rather sudden. The projectile type of vomiting together with definite gastric peristaltic waves and the occurrence of a pyloric tumor should however establish this diagnosis.

Primary peritonitis is a rather rare condition which may develop from rupture of the mesenteric lymph nodes or by direct passage of the inflammatory products through the intestinal wall. In this condition, the child appears extremely ill, the abdomen is distended and rigid, and signs of general intoxication are present. The leucocyte count is frequently very high, reaching 75,000 at times.

Colic is, perhaps, the most common abdominal pain in infancy. It is paroxysmal in character, recurs from day to day, pressure and massage seems to decrease the pain and complete relief is usually obtained when the bowels are evacuated together with the passage of flatus. This together with the absence of fever establishes the diagnosis.

In the older children, the group of 5 to 15 years of age, the symptoms and signs of acute appendicitis are quite similar to those encountered in adults. I believe it is worth while to restate and emphasize the sequence of symptoms. Pain is the initial symptom in an acute attack of appendicitis, later followed by vomiting but practically never preceded by it. The pain in the early stages is colicky in nature and usually referred to the region of the umbilicus and upper portion of the abdomen. This pain may be explained by the obstruction and tension within the lumen of the appendix and is transmitted through the sympathetic nervous system. Later, with peritoneal involvement the pain localizes in the right lower quadrant and becomes quite different in character. It is usually less severe but constant. This pain is due to parietal involvement of the peritoneum and the impulses are transmitted over the afferent branches of the cerebrospinal tracts. Local findings are absent when the appendix is retrocecal or retroiliac until the process is well advanced because these parietal spinal nerves are protected by the cecum and ileum. Similarly localization is absent when the appendix lies in the pelvis because of the lack of peripheral nerves to those segments of the abdominal wall.

Therefore, it is evident that the early pain of appendicitis is quite different from the later one, as to character, cause of production and nerve inervation. The later pain is due to parietal peritoneal inflammatory reaction and is transmitted over the cerebrospinal tracts. Early in appendicitis we have the pain of obstruction later followed by that of infection.

With these facts in mind, one proceeds to

examine the child for the presence of localized tenderness, muscle spasm and rigidity. By gradually gaining the confidence of the little patient and using gentleness during the procedure, one is able to elicit the true findings. The examining hand should be warm and all parts of the abdomen and lower part of the chest carefully palpated before any attempt is made to detect tenderness or rigidity in the right lower quadrant. Before attempting deep palpation, one may often elicit a hyperesthesia of the skin of the right lower quadrant. Muscle spasm and rigidity of the right rectus may be present over its entire length up to the costal margin.

*The finding of a definite point of tenderness is, to my mind, of great diagnostic importance.* We must keep in mind that the appendix may occupy a number of different positions in the abdomen. In case of insufficient descent of the cecum, the tenderness is found to be high. Where rotation has not been complete, that is in the retrocecal or retroiliac type—this point of tenderness may be in the flank or in the region of the right kidney. Not uncommonly, due to exceptional length of the appendix in childhood together with a long mesocecum, it is often found below the brim of the pelvis. On this account, the point of tenderness may be at McBurney's point—in the right flank—or may not be elicited at all unless a careful rectal examination is made when one may find a decided difference between the right and left sides. Pain may often be elicited in cases where the appendix is situated posteriorly, by applying gentle pressure through the abdominal wall toward the psoas muscle and at the same time supporting the right leg. By suddenly withdrawing support to the leg and thereby causing the psoas to contract against the inflamed appendix, definite pain may be produced.

The *vomiting in acute appendicitis is as a rule not persistent or forceful,* although cases are met with where the vomiting assumes alarming proportions.

*Anorexia is usually present even to the degree of aversion to food. I think we may say that we rarely or never see a child with acute appendicitis complaining of hunger or expressing a desire for food.*

Careful observance of the posture and general behavior of the child often gives valuable information. The child may not appear acutely ill. The color may be normal or there may be a pallor to the face due to nausea. Restlessness may be due to distention of the appendix or to pain. Respiration is definitely costal in character rather than abdominal and the patient assumes a position in bed which will insure maximum relaxation of the abdominal muscles as evidenced by flexing of the leg on the abdomen. This protective attitude can often be demonstrated if the child is carefully assisted out of bed and asked to take a few steps. He will then favor the right side by keeping the right leg flexed at the hip and knee and walk with a considerable limp.

In the pelvic type of appendicitis, rectal examination is of particular value. The left side should be examined first to obtain normal feel, then the right side. Tenderness, tension or a mass may often in this way be elicited. In such cases, inward rotation of the flexed right thigh will produce a pain (the s. c. "obturator" sign).

Chills are rarely if ever present at the onset of appendicitis. The temperature is usually low, 99 to 100 degrees, and rarely exceeding 101 degrees. A differential leucocyte count may or may not be indicative. The total count rarely exceeds 20,000 but the polymorphonuclears may exceed 80%. Of course, it is a well known fact that a drop even in a moderate leucocytosis may indicate perforation and a "silent" period until peritonitis sets in.

Diarrhea is encountered in certain types, particularly in those where the appendix is retrocecal and the inflammatory process extends to the cecum and adjacent ileum. On the other hand, appendicitis is occasionally seen as a complicating disease during or following severe infectious enteritis. Similarly dysuria or hematuria may be present in cases where the appendix is in close proximity to the ureter or bladder.

The differential diagnosis of acute appendicitis in children involves many more problems than in adults. Many conditions occur in children which may be mistaken for appendicitis.

*Pneumonia* with or without pleurisy often presents symptoms suggesting acute appendicitis; 25 patients out of 145 cases of pneumonia admitted to Boston City Hospital were sent there under diagnosis of acute appendicitis.

The general appearance of the child with

pneumonia is rather striking and different from that of acute appendicitis. "The child appears sick, face is usually flushed, increased grunting respiration, temperature is usually above 101 to 104, leukocytosis is high, frequently above 20,000, the respiration is abdominal in type, the respiratory excursion of the abdomen is greater than that of the chest."

The child with appendicitis is usually pale, lays quiet in bed, assuming a posture to insure abdominal relaxation,—the temperature is low, leukocyte count usually below 20,000, the respiration is costal in type; the costal respiratory excursions greater than the abdominal. The value of comparing the costal and abdominal respiratory excursion has been demonstrated by the work of McClure.

In border line cases and particularly in the early stages of central pneumonia the x-ray findings of the lungs are of great importance.

Abdominal pain is a frequent complaint in many forms of sore throats, particularly so in pharyngitis of s. c. grippy infection. The pain is colicky in nature; may be mild or severe. All parts of abdomen seem to be tender but the pain is usually greater than the tenderness. That is the reverse of appendicitis. The differential diagnosis may be exceedingly difficult to make, particularly as we frequently see acute appendicitis associated with or following upper respiratory infections.

Symptoms of appendicitis often occur in the acute infectious diseases. Measles, particularly in its early stage, may present such a picture. Here careful search for Koplik's spots together with leukopenia establishes the diagnosis. In this connection I would like to quote from Ronaldson, who made a recent study at three of the large contagious hospitals in London: "The appendix is frequently involved in the pathological processes which are met with in the acute infectious diseases; but suppurative appendicitis is rare; appendicular symptoms are less common than might be expected, and localizations are exceptionally rare."

Pyelitis may simulate retrocecal appendicitis. Temperature is higher than general condition would indicate. Repeated urine examinations must be made and the amount of pyuria taken into consideration.

*Summary:* Acute appendicitis is rather rare in infants and children under 4 years of age.

Any young child with reslessness, abdominal pain, vomiting and low-grade temperature must be considered a potential case of appendicitis.

The pain in appendicitis is first of obstruction and tension within the lumen of the appendix and is registered through the sympathetic pathways. This pain does not shift nor change into the second pain. This later pain is of independent origin and is transmitted over afferent branches of the cerebrospinal tracts.

General postural characteristics, certain methods of examination particular to children, are of importance in the diagnosis.

In early diagnosis and the avoidance of cathartics lays our hope of decreasing the mortality of appendicitis in children.

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## DIAGNOSTIC DIFFICULTIES IN APPENDICITIS

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I am left with the happy task of summarizing what has already been said. So inclusive and so excellent have been the preceding papers that I shall attempt to add very little to them.

The diagnosis of acute appendicitis is made on five cardinal features and five alone, namely, abdominal pain, nausea and vomiting, tenderness and rigidity, fever and leucocytosis. These are the cardinal features and should be present in every typical case of acute appendicitis. I have never seen acute appendicitis without abdominal pain. I have seen patients without nausea and without vomiting but in the typical case vomiting is present usually once. I have never seen a patient with acute appendicitis who did not have localized tenderness and rigidity. One must be able to appreciate the differences in rigidity between the two sides of the abdomen. I have seen patients who did not have a fever not even when the temperature was taken by rectum but this is not the rule and is certainly uncommon. The patient should have a fever; it should not be high; it should range from perhaps 99.6 to 100.6 or 101. When it is higher, at least

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in adults, watch out. I do not believe that I have ever seen an acute appendicitis without a pretty fair increase in the percentage of polymorphonuclear leukocytes even in a count which is on the borderline. When a patient with the typical history and findings has a low blood count one may with great propriety ask for another count because at times even the laboratory makes a mistake. In such a situation two counts are better than one.

Now the two features which must be present in order to make a diagnosis of acute appendicitis are 1. abdominal pain, and 2. localized tenderness. Without them I do not know how you can make a diagnosis of acute appendicitis. And of all the features the probability is great that given a history which is at all suggestive, the presence of definite localized tenderness is the most important.

The diagnosis of acute appendicitis, therefore, rests on the orderly sequence of the march of symptoms combined with the findings of localized tenderness, some fever and at least a polymorphonuclear increase.

I should beware of the patient who has pain which started some place other than where it should have started. I should beware of the patient who first had pain in the back, first had pain in the pelvis, first had pain right over the right lower quadrant, first had pain in the right upper quadrant. *A priori* this is not appendicitis. I should beware the patient who has an initial vomiting without pain. I should be disturbed in making my diagnosis of acute appendicitis if diarrhea complicates the picture early and particularly if this diarrhea is coupled with nausea and vomiting more than once. I should hold my diagnosis in abeyance for a bit if the picture starts out with a chill. Look here for pyelitis or for pneumonia or for malaria. I have seen appendicitis with chills but only when the acutely inflamed appendix lay over the ureter or tucked up by the renal pelvis. Now I should be much disturbed by a leukopenia. I do not believe I have ever seen an honest acute appendicitis with a leukopenia. When such a blood count comes along in the presence of suggestive findings, then do another blood count, perhaps a third, have a differential done and if the differential does not show a good clean polymorphonuclear predominance do not operate at once, observe the patient for four hours let us say. Beware the leukopenia, watch out for the patient with a cough, watch him breathe, look at the ala nasi for dilatation, look carefully at the sputum if he is able to bring any up. Our acute appendicitis may be diaphragmatic pleurisy or central pneumonia low in the lobe.

It would appear to be good procedure to observe our patient with acute appendicitis for perhaps two to four hours, i.e. assuming that we have seen him early. In this period one may rule out or in those disturbing features which crop up later to embarrass us.

After the patient has been sick for two or three days then one is confronted with a different picture. Here he must differentiate the *complications* of appendicitis; rupture, spreading peritonitis, tumor formation, ileus, etc. Here it is, that a consideration of the orderly sequence of events in the clinical march of the disease is of great value in indicating either the diagnosis or the procedure necessary at the time.

The patient who has pain on deep breathing, the patient who refers his pain to the right shoulder on deep breathing probably has a diaphragmatic pleurisy, not appendicitis. If he does have an intra-abdominal process it is more likely to be an acutely inflamed gallbladder under which situation pain at the end of deep breathing is common.

In perforation of a peptic ulcer the one essential is board-like rigidity. Also in acute pancreatitis. If you cannot dent the epigastrium and a bit later cannot secure any relaxation at all of the upper abdominal muscles you do not have appendicitis, you have a perforated ulcer or pancreatitis.

In tabes dorsalis with crisis the abdomen is usually flat and soft and the patient vomits and vomits. In mesenteric thrombosis one must look for a focus of such an embolus—if the heart is fibrillating then consider the possibility of mesenteric embolism.

Again in a female patient an acutely *severe* insult to the abdomen is not apt to be appendicitis, it is more apt to be a ruptured ectopic pregnancy or a twisted ovarian cyst. In other words, the orderly progression is lacking and the outstanding feature is an acute and sudden insult with a subsequent pallor and coldness.

Lead colic usually has a flat scaphoid abdomen.

Herpes zoster before the vesicles has a very, very sensitive superficial skin. Pyelitis is almost always associated with plenty of pus on catheterization of the bladder. I know of no way of differentiating diverticulitis from acute appendicitis and I do not think any one else does either, that is Meckel's diverticulitis. However, we can keep it in mind especially in children.

Therefore, let us summarize: Acute appendicitis is diagnosed on the orderly march of the symptoms of epigastric, paraumbilical pain which in four to six hours localizes over the anatomical position of the appendix, followed by nausea and vomiting usually once, rarely more, and associated with localized tenderness and rigidity, a moderate fever, and leukocytosis. The differential diagnosis takes in many, many conditions, which situation predicates and examination of the entire patient and an evaluation of numerous possibilities.

Beware the patient with acute appendicitis whose pain starts with a chill, which starts some place other than in the epigastrium or about the umbilicus, who has a high fever, who has a low blood count and especially a leukopenia, who vomits and vomits, who has a persistent diarrhea, who coughs and has pain in deep breathing. Lastly, without localized tenderness and a history of abdominal pain do not make a diagnosis of acute appendicitis.

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## POST-OPERATIVE COMPLICATIONS OF ACUTE APPENDICITIS AND THEIR TREATMENT

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The postoperative complications of acute appendicitis and their subsequent treatment, depends to a large extent upon the stage of the disease with which one is dealing. Thus, complications are most rare when the operation has been performed in the first thirty-six or forty-eight hours. They are more numerous and grave during the intermediate period extending from the second to the sixth day. Cases living to come to later operation, usually have developed an immunological response and some localization of their peritoneal infection.

Among the commoner postoperative complications are peritonitis, local or general. With the spread of peritonitis "adynamic" or paralytic ileus develops. The abdomen becomes distended, on palpation there is a "doughy feel," and peristaltic activity is at a minimum. Frequent regurgitation, hiccough and rectal tenderness, associated with a rapid rise in temperature and pulse follow. The Ochsner routine, high Fowler's position, with the patient sitting up, the indwelling nasal catheter, negative suction, intravenous glucose 5% in sterile water, subcutaneous fluids, enemas, morphine freely, pitressin, stimulants and general symptomatic treatment should be instituted early. Continuous negative suction through the rectal tube may also be used. Don't forget that the patient's thirst is a good guide to his need for fluid.

Mechanical obstruction occurs later than paralytic, usually occurring between the sixth and tenth days. Colicky pains associated with nausea, and vomiting, and a rapid rise in pulse rate, out of proportion to the temperature rise is present. Peristaltic activity may be seen, felt and heard. Surgical interference usually becomes necessary, although with the use of constant negative suction, relief of the obstruction may follow if it should be on an inflammatory basis.

Secondary abscess should be suspected if the temperature and leucocyte count remain high. A mass can sooner or later be demonstrated by an area of localized tenderness and resistance in the abdomen. Surgical intervention should be postponed until definite fluctuation is present. At this stage the abscess can be opened without again contaminating the free peritoneal cavity. Frequent rectal and vaginal examinations should be made to detect the presence of pelvic abscess. These may be drained through the rectum in the male and through the posterior fornix in the female. The drainage should be done when possible keeping out of the free peritoneal cavity.

Subphrenic abscess usually appears still later and can be best demonstrated by the x-ray. It may be suspected by a recurrence of fever with a progressive septic process. Increased liver dullness with diaphragm elevation, and sometimes edema in the mid-axillary line, can be demonstrated.

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Fecal fistulas, frequently follows long drainage especially where hard rubber tubes, which I never employ, have been used. These cases, however, usually recover, and the fistula usualy heals spontaneously. They are a great discomfort to the patient. Constant suction at the site of the lesion may greatly facilitate healing.

Pulmonary complications are most apt to occur following a general anesthetic, but they may follow local or spinal anesthesia.

Thrombosis, especially of the left femoral vein, liver abscess, pylephlebitis, pyemia, and embolism, may occur. Postoperative adhesions are usually present in the abdomen which has been opened. Incisional hernia is especially apt to occur in the pus case or in any case where stress or strain comes during or after closure. This is much less apt to occur with the McBurney incision.

Late partial, or complete intestinal obstruction may occur, often years after operation.

I wish to briefly report on 563 consecutive cases of acute appendicitis which I have operated on. Of this number, complications were encountered in 101 cases; 90 of these patients had a ruptured appendix with peritonitis, all when I first saw them. In 47 cases the appendix was removed, drainage instituted, and the patients recovered without further complications.

In 8 cases the abscess only was drained and these are now all well for an average of four years with no further trouble.

In 4 other drainage cases, three came to surgery for a gangrenous appendix in one year and one in eight years.

Seven pregnant women were operated on, three miscarried. One, six months pregnant, had a ruptured appendix with a generalized peritonitis, recovered, and went to term for normal delivery. The only one drained. Another with a 20,000 white count, appendix full of pus, went to term with a normal delivery. A third, a seven months case with a 17,000 white count, with a gangrenous appendix, not ruptured, went to term normally. The three cases which miscarried, were all under three months.

Fecal fistula was encountered only once. This patient, who was at first only drained, developed a fecal fistula, intestinal obstruction, and a recurrent gangrenous appendix in thirteen months time, much of which time he spent in the hospital.

Other complications were, seminal vesicle abscess 1, acute pancreatitis 1, incisional hernia 2, thrombophlebitis 3.

Eight had secondary localized abscesses as well as other complications which included hernia 1, intestional obstruction 1, suppurative parotitis 1, lung abscess 1, pneumonia with em pyema 1. All the above cases recovered. In all these, except one, the appendix was removed at the primary operation, and this patient today is well, eight years after operation and he still has his appendix.

From the 101 complicated cases, 21 deaths occurred, (3.7 per cent. of the total cases) and all these were caused by a generalized peritonitis and its associated complications except four. One pus case developed an atelectasis of the right lung. One died three months after the primary operation from a mesenteric thrombosis and a gangrene of the bowel following a suppurative Meckel's diverticuleum which was not recognized at the first operation. One died of an influenzel bronchopneumonia. One, a clean case, died of embolism on the day he was discharged to go home, the source apparently being the right iliac vein.

It must be remembered, that with the development of peritonitis there arises the question of procedure and as Dæ Costa has stated, the question is of choosing between a dangerous delay, or a dangerous operation. If the expectant treatment is thought feasible, then the method of Ochsner with various modification, may be instituted to control peristalsis and attempt to limit the infection. Although the usual plan has been to inhibit peristalsis and promote rest with the opiates. I feel that with marked distention the value of such drugs as pitressin or prostygmin in delaying the ileus far outweighs the danger of spreading infection by increasing the peristalsis.

In reviewing these 563 cases, I am again impressed with the fact that every operation has a percentage mortality. This mortality can be greatly lowered when physics are eliminated as a form of treatment for belly-ache. In the complicated cases about nine out of ten had taken one or more physics, and they had usually delayed consulting their physician.

References have been made freely from: "Preoperative and Postoperative Treatment," (Mason) and "Surgical Diagnosis." (Graham.)

## WHOOPING COUGH: DIAGNOSIS AND PREVENTION

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Various factors contribute to the frequency of whooping cough, with its perennial toll of infant deaths. In the first place, the young are highly susceptible to infection with the Bordet-Gengou whooping cough bacillus. Although the incidence peak is in the fourth year of life, nearly all whooping cough deaths occur during the first two years. In the second place, infected infants develop immunity with difficulty; they are prone to contract serious intercurrent diseases, chiefly enteritis and bronchopneumonia. The non-immune child will not develop whooping cough unless pertussis bacilli reach the deeper, vulnerable parts of the respiratory tract. This pathogen soon becomes established in this fertile soil —its natural habitat—where it multiplies rapidly. Within a fortnight, the first clinical manifestations occur. The most contagious period is early, before the characteristic whoop is well established. Diagnosis (and quarantine) are often delayed, because early diagnosis is usually beset with difficulties. A history of intimate exposure of a non-immune child to a coughing child who subsequently whoops and vomits, is often of diagnostic importance, especially when the disease is prevalent. In no other contagious disease of early life are diagnosis and quarantine so long delayed. As a result, in the course of a few months, numerous new cases spring up in the community.

The cough plate method of early diagnosis has withstood the test of time. Due to the difficulties encountered in various steps of the technic, comparatively few laboratories make use of it. When the whoop is already well established, plates are seldom positive. When freshly prepared plates of Bordet-Gengou medium are properly exposed (Fig. 1) early in the disease, the minute, zoned colonies of the whooping cough bacillus are often visible at the end of three days' incubation. Negative plates, no matter how well they are coughed upon, do not exclude whooping cough. A child, who has completely recovered from whooping cough, may develop a recurrent, paroxysmal cough, months or years later. The attacks of coughing may simulate pertussis. Cough plates have been exposed to quite a number of such coughing children who had had unquestionable pertussis previously. In only one such instances was B. pertussis recovered. If a child has had typical pertussis, it is rather unusual for a subsequent, paroxysmal cough to be due to B. pertussis. Mothers, and especially grandmothers, on the other hand, when intimately and repeatedly exposed to children with pertussis in the household, not infrequently contract the disease a second time. Cough plates, exposed early, in over twenty such instances, have usually been found positive.

Fig. 1. A positive cough plate is a valuable aid to early diagnosis.

Lymphocytosis gains in diagnostic importance when the cough has persisted for more than ten days, or whenever well-exposed plates are negative. A white cell blood count below 15,000, or the absence of lymphocytosis does not exclude pertussis. When differential white cell blood counts are made, it should be borne in mind that during the first few years of life, an excess of small lymphocytes is normal. The second half year of life is probably the best age for prophylactic vaccination with potent B. pertussis vaccine. The details of its commercial preparation have been perfected. Since physicians more fully appreciate the importance of vaccine refrigera-

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tion, dosage and details in administration, failures have become infrequent. The total dosage for children less than two or three years of age is 8 cc., (2., 3., 3. cc. in three weekly injections), just under the skin. For children more than two or three years of age, the total dosage is 10 cc.—2., 4., 4. cc. at weekly intervals. Commercial vaccine, authorized by Northwestern University Medical School, is made by two biological laboratories. Most infants and young children, injected with such vaccine, acquire immunity within several months.

Since 1932, we have injected a total of 8 or 10 cc. of these two authorized, commercial vaccines into about 3000 non-immune infants and children. These were quite equally divided among private patients, Evanston Health Department "Welfare" infants, "The Cradle," and other institutions. Their average age was about ten months. About 300 instances of probable exposure have been reported, subsequently, by the mothers, welfare and institutional nurses. In over fifty, intimate exposure occurred in the household, to pertussis in the non-injected, older (control) children. To date, a total of 25 injected children have contracted the disease, more than four months after inoculation.

In 1936, 91 cases of whooping cough were reported to the Evanston Department of Health. The annual average for the ten preceding years was 334. Only one of the 91 children had had pertussis vaccine. That child had had the injections after he had been exposed.

### CONCLUSIONS

Earlier diagnosis, earlier quarantine and three, weekly preventive inoculations with authorized vaccine (preferably during the second half year of life), should decrease the incidence of whooping cough with its perennial toll of infant deaths.

### DISCUSSION

Dr. Orville E. Barbour, Peoria: It seems to me that one point worthy of emphasis is the frequent difficulty of diagnosis of whooping cough cases. Any measure which may help, such as the cough plate, is certainly worthwhile. Dr. Sauer has pointed out that one needs to take into consideration the history of exposure, the nature of the case, the whoop, the blood picture, and the cough plate if it is available. I hope that Dr. Sauer's efforts will stimulate the health commissioners' of Peoria to have the cough plate cultures made available for the physicians of this and adjacent communities. Such an action should prove of distinct benefit in assisting in the diagnosis and control of whooping cough cases. It should be kept in mind, however, that the cough plate is not infallible. It is not an absolute diagnostic method, but a useful aid towards making a diagnosis.

I would like to pay tribute to Dr. Sauer for the splendid work he has done. Whooping cough has taken a terrible toll of infants and children. Anyone who will give a great deal of both time and energy along with a busy private practice, to work out a method for protecting our children from this dreaded disease, as Dr. Sauer has done, deserves a great deal of credit. His percentage of apparent protection is encouraging. So far our results in Peoria seem to be better than that. Whether or not this higher percentage will continue, of course only time will tell. Immunized children who later do contract whooping cough do seem to have milder cases. Such interpretations, however, are dependent upon personal impressions, and do not constitute positive evidence of the value of the immunizations.

Just one more thing which I believe is worth mentioning. Up until a year ago most of us were injecting diphtheria toxoid before giving the whooping cough immunizations. At the meeting of the American Academy of Pediatrics at Kansas City last year, Dr. Leake of the U. S. Public Health Service at Washington, D. C., told us that it had been found from statistics that the previous administrations of diphtheria toxoid seemed to inhibit the beneficial effects of whooping cough immunizations. With that in mind, those of us who had the benefit of Dr. Leake's suggestions have been advising the whooping cough immunizations at six months, the diphtheria toxoid at nine months, and smallpox vaccination between ten and twelve months of age.

Dr. L. W. Sauer, Evanston (in closing): I have nothing to add except to stress the importance of giving the vaccine early in life. In children more than two years of age, give 10 c.c. in place of the customary 8 c.c. Since we have done that, we have had fewer failures with the authorized commercial vaccine.

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## THE TREATMENT OF SPINAL CORD INJURIES

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Damage to the spinal cord or nerve roots which accompanies fractures or dislocations of the vertebræ seriously complicates otherwise simple therapeutic measures. In some of these cases the judgment of the physician is tested to its utmost to determine the proper pathologic diagnosis and the most effective therapeutic procedure. The question is not alone that of the indications for or against surgical measures;

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rather, the problem is one of diagnosis and treatment wherein anatomy, neurophysiology, and neuropathology play a greater part than is at first apparent.

Nearly all of the injuries of the spinal column which are associated with cord injury are produced by violent flexion or extension of the spine. The force may be applied to the lower end of the spinal column, as is illustrated commonly in falls from a considerable height or in automobile accidents; or to the head, as is illustrated by diving into shallow water. The vertebræ may be dislocated, or, as is more common, there may be a fracture-dislocation. In addition to a fracture of the body of the vertebra, there may be a fracture of one or both articular processes with a forward displacement of one vertebra upon the next below or, the laminæ and processes may be involved. The degree of injury to the spinal cord is dependent upon two factors: the amount of displacement antero-posteriorly and laterally, and the rotation of the vertebra.

True anatomic damage to the cord may vary in degree from that caused by one or more small discrete areas of hemorrhage to larger lesions due to gross hemorrhages. Other foci of damage may be more mechanical in type and vary from partial compression to complete transection of the cord.

From a consideration of the anatomic relationships between the spinal cord and the vertebral column, it is not difficult to understand the mechanism by which the spinal cord is damaged in fractures of the vertebræ. Nor is it difficult to understand how severe blows or jars to the spine may cause damage to the spinal cord with hemorrhages into its substance. In fact, the wonder is that of all the patients who receive fractures and fracture-dislocations of the vertebræ there are not more instances of injury to the spinal cord among them.

The injured spinal cords may show as diversified a picture as the patients show clinically. At the site of the injury there is an initial edema and hemorrhage, varying from petechial to gross, within the substance of the cord. Early one can find swelling of the myelin sheaths, breaking up of the myelin, and later fragmentation of the axons. Phagocytes and scavenger cells of various origins, both from the blood (leukocytes) and from the nerve tissue (microglia, astrocytes), are in evidence, especially near and in the area of major damage. The ganglion cells undergo a change in cases of severe spinal shock even though recovery may occur. In severe local lesions the ganglion cells at the site of injury are involved to a greater degree; but even those cells some distance below the level of the lesion early present a picture not unlike that of beginning Wallerian degeneration, a state known as an axonal reaction. These cells usually recover and later may show no microscopic signs of previous damage.

It goes almost without saying that every case of injury to the spine should be subjected to a careful and painstaking neurologic examination. For this purpose a knowledge of some fundamental facts of neuroanatomy and neurophysiology and familiarity with a few important fiber tracts are necessary for the simplest understanding of spinal cord lesions and the resulting symptoms. In addition, however, there are certain facts which must be kept in mind about the vertical localization of motor, sensory, and reflex functions in the different segments of the spinal cord.

If only a few of the motor segmental levels are kept in mind they will serve as an aid in determining the location of a given lesion. For example, the motor segmental innervation of the deltoid muscles, which abduct and externally rotate the arm, is in the fifth cervical segment of the spinal cord. The biceps muscle is innervated by the sixth cervical segment, and the triceps by the seventh cervical segment. Therefore, given a patient with a spinal cord lesion, who can flex but is unable to extend his forearms, one may state definitely that the lesion does not extend higher than the seventh cervical segment. Likewise, the abdominal recti muscles above the umbilicus are innervated by the ninth and tenth thoracic segments, while the same muscles below the umbilicus are innervated by the eleventh and twelfth thoracic segments. Therefore, when the patient is asked to flex his neck with the hands by the side, if the umbilicus moves upward evidence is present of paresis or paralysis of the lower halves of the recti muscles. This is known as Beevor's sign and aids in determining the level of a lesion at the tenth thoracic segment.

Many anatomic, physiologic and experimental investigations have shown that the skin of the

body is divided into zones in relation to the various segments of the body. If one imagines the body in the all-fours position of our ancestors, and then makes transverse sections of the body at regular intervals, beginning at the neck and passing to the coccyx, the segmental sensory distribution of the spinal cord will be understood more clearly. Because in this posture the thumbs and great toes naturally are in an advanced position, it will be readily seen that the corresponding sides of the arms and legs will be sectioned at a higher level than will be the opposite sides. For this reason the radial sides of the upper extremities are represented by a higher segmental level of the spinal cord than are the ulnar aspects. In the same manner the medial aspects of the thighs and legs are of a higher segmental level than are the external sides of the lower extremities. The successive segmental levels in the thoracic region are understood easily, and as one passes caudally the segmental representation of the primitive tail is about the anus. It is apparent at once that a loss of sensation which corresponds to a segmental area is diagnostic not only of a spinal cord lesion but of its level as well.

To these general diagnostic aids may be added the important symptoms characteristic of *upper* and *lower motor neuron lesions. Lower motor neuron lesions* occur as the result of injury or disease of the anterior horn cells, the anterior roots or the peripheral nerves, and only of those structures. They are accompanied by a flaccid paralysis, loss of deep tendon reflexes, muscle atrophy, and the reaction of degeneration as determined by electrical stimulation of the muscles. Of these three possible sites of a lower motor neuron lesion, the presence of sensory changes is diagnostic of a peripheral nerve lesion. An *upper motor neuron lesion* is characterized by the presence of a spastic paralysis, exaggerated deep tendon reflexes, absence of muscle atrophy, pathologic reflexes (Babinski, Oppenheim, Gordon, Chaddock) and absence of superficial reflexes (abdominal and cremaster). Such a lesion may occur at any level in the corticospinal tract. The occurrence of cranial nerve paralysis, involvements of other functional systems and the distribution of the motor weakness will determine the level of the lesion. For example, a paraplegia occurs rarely in cortical lesions but is common in spinal cord lesions.

It is unfortunate that there are no known criteria by means of which the doctor can differentiate clinically between a complete physiologic and a complete anatomic interruption of spinal cord function. The former may be a more or less rapidly recoverable lesion, but the latter is an irreparable damage from which recovery does not occur. As in the case with peripheral nerve lesions, a complete phyiologic interruption of the spinal cord cannot be differentiated from a complete anatomic section. Both are followed by complete paralysis in the muscles supplied by nerves which originate below the level of the injury. In both, complete sensory loss results below the level of the injured segment, and the reflex changes and bladder disturbances may be similar. Therefore, it becomes necessary to develop a method for the recognition of incomplete lesions.

Although many cases of incomplete anatomic lesions of the spinal cord show complete physiologic interruption, a large number may present only partial paralysis of the muscles below the level of the lesion or preservation of one or all types of sensation. In such cases the indications are quite clear. However, when the loss of motion and sensation is complete the problem is more difficult.

The symptomatology which follows a complete transection of the spinal cord may be divided into three stages:

The first is a stage of muscular flaccidity, corresponding to the period of spinal shock. In this state the paralyzed muscles are toneless and flabby, all the superficial and deep reflexes are lost, and there is a retention of urine and feces. At times retention of urine and incontinence of feces have been observed, and at times the cremasteric and bulbocavernosus reflexes have been elicited.

The second—or stage of reflex activity—begins with the first reflex response to an external stimulus, usually from the sole of the foot. In the full development of this stage a stimulus applied to any part of the lower extremity gives rise to a flexion reflex of the hip with adduction of the thigh, of the knee, and of the ankle. When reflexes can be evoked with ease, an extensive and widespread reflex action can be obtained

which has been called a "mass reflex." This consists of a flexion spasm of the anterior abdominal wall and of the lower extremity, evacuation of the bladder, when its contents accrue to a certain amount, and sweating from an area from the skin in the paralyzed region. One of the most receptive fields of exciting reflexes is the genital area, and the cremasteric, dartos, bulbocavernosus reflexes and erection of the penis are commonly present. During this stage, in some cases the knee and ankle jerks can be evoked.

The third stage, that of gradual failure of reflex functions of the isolated spinal cord, usually preceding death, consists of the gradual return to a condition closely simulating the first stage.

Certain differences of reaction in incomplete lesions may be pointed out. In complete lesions the flexor type of movements is observed commonly, while in incomplete lesions extensor types of movements are present frequently. In complete lesions, the posture of the lower limbs is one of slight flexion; in partial lesions, extension. As a general rule, partial lesions of the spinal cord show a condition comparable with that of a decerebrate animal in which there are defense reflexes with marked spasticity. Although an extensor type of response to plantar stimulation has been observed in complete section of the spinal cord, usually such a stimulation is followed by a plantar flexion of the toes, and as a fairly general rule, it may be stated that an extensor type of reflex is strongly indicative of an incomplete lesion. Inasmuch as prolonged states of toxemia, or septicemia from urinary sepsis, or bed sores, have a profound influence in hastening the reappearance of the reflex inactivity in cases of complete section of the spinal cord, it frequently occurs that from the practical standpoint, incomplete lesions are relatively easily recognized by the long persistence of spasticity and the signs of a paraplegia in extension.

Of particular value in the recognition of incomplete lesions is the early appearance of a Babinski sign; the failure to evoke mass reflexes from above the knee; a definite history of the absence of a state of spinal shock; marked tonicity in the paralyzed extremities; the involvement of both flexors and extensors in reflex movements provoked by the stimulation of receptive fields; and, of course, in obviously incomplete lesions, the absence of total paralysis or anesthesia below the level of the lesion.

The most discouraging experiences are upon record in the treatment of spinal cord injuries in the cervical region. We have observed eleven fracture-dislocations of the cervical vertebræ, all of which have been associated with definite symptoms of spinal cord injury. Six of these patients were injured by diving into shallow water; two were in automobile accidents; one patient had a pathological fracture of the fifth cervical vertebra due to a vertebral metastasis; one football player was among this group of patients; and another had injured himself falling down a flight of steps. The highest vertebral level was the fourth cervical and of these there were four while the other injuries involved the fifth, sixth, and seventh vertebræ. Fractures of the laminæ, spinous processes and dislocations anteriorly, posteriorly and laterally impinged upon the spinal canal in each of these patients, all of whom were operated upon, except one whose symptoms indicated an incomplete and spontaneously recoverable injury.

Injuries in the region opposite the cervical enlargement of the cord show characteristic symptoms. In all of our cases there was a more or less complete paralysis of the muscles of the lower extremities and the trunk with a partial paralysis of the muscles of one or both upper extremities. If the fifth and sixth cord segments are not injured the deltoid, biceps, brachialis anticus and supinator muscles are not involved although the muscles of the forearm and hands may be paralyzed. As Thorburn pointed out, these patients lie with the arms abducted, the forearms flexed and rotated outward. The power of the upper extremities may be preserved in injuries below the first dorsal vertebra although weakness in the triceps can usually be detected. In one of our patients, injured in an automobile accident, a fracture-dislocation of the fifth cervical vertebra had produced an immediate and complete loss of motion and sensation in both arms and legs. Within three weeks a slight degree of motion had returned in his left arm and leg and on this side below the clavicle there was a complete loss to pain and temperature stimuli. Sensation on the right side was intact though motion was completely absent. This interesting group of symptoms, first described by Brown-

Séquard, are indicative of a unilateral lesion of the spinal cord.

Severe pain in one or the other shoulder is prominent in injuries of the sixth cervical to the first dorsal vertebræ and there may be root hyperesthesias or anesthesias over the shoulder, in the axilla, or on the radial or ulnar sides of the upper extremities. If the lesion extends up to the fifth or sixth cervical segment the sensory disturbances will affect the radial side of one or both forearms, but if it does not extend above the seventh cervical segment only the ulnar sides of the upper extremities are involved. Priapism is frequent in injuries of the cervical cord and an elevation of the temperature to 107 or 108 degrees is quite characteristic. This type of hyperthermia is not affected by the common therapeutic measures employed to lower the temperature in other conditions.

Lesions of the brachial plexus may often accompany compression injuries of the cervical spinal cord. These are usually of two clinical types. There may be an immediate paralysis of all four extremities, which is quickly followed by the return of motion in one arm and leg. The opposite arm then presents a flaccid paralysis, the corresponding leg a spastic paralysis and there is loss of pain and temperature sensation on that side of the body in which motion has returned to the extremities. The spastic paralysis of the leg may eventually disappear and a residual flaccid paralysis of the upper extremity remains.

In another clinical type, the patient may sustain an injury to the brachial plexus and then several days or weeks later may develop a slowly progressive paralysis of the leg on the same side, with loss of pain and temperature sensation on the opposite side. In these cases it is necessary to determine whether the flaccid paralysis of the arm, distinctly a lower motor neuron lesion, is due to an injury to the nerves of the plexus, to the roots, or to the anterior horn cells of the spinal cord.

If the lesion is one of the plexus itself, the loss of touch sensation will be greater than the loss to pain. If it affects the roots, the loss of pain sensation will be more extensive than the loss to touch. If only the anterior horn cells are involved, sensation will be unaffected. However, if sensory loss exists with such a lesion of the gray matter, then light and pressure touch as well as pin prick and pressure pain will be absent. Finally, if the paralysis in the leg disappears relatively soon and the arm paralysis persists, it speaks for a brachial plexus lesion as against one of the spinal cord.

We have operated upon eight patients with injuries of the spinal cord due to fracture-dislocations of the eighth to twelfth thoracic vertebræ, but none which have involved the upper thoracic spine. All of these patients were injured in automobile accidents except two who fell from a height and struck in the sitting posture and one coal miner, who was dragged for a hundred feet in a jack-knife position. The rather characteristic symptoms produced by involvement of the twelfth thoracic vertebra are illustrated in the following case as are the dangerous results which are likely to follow unskillful attempts to reduce or "adjust" such dislocations:

A young woman fell down a flight of stair steps and immediately lost control of her legs and sphincters as well as suffering a loss of sensation to all stimuli below the level of the tenth thoracic skin segment. At the time of her injury she was 4½ months pregnant, but successfully delivered her baby at term. For two years she was subjected to attempts designed to reduce a dislocation of the twelfth thoracic vertebra. When she entered the hospital, the motor and sensory findings were unchanged; the deep tendon reflexes of the lower extremities were increased; pathological reflexes were present and the lower abdominal reflexes were absent.

A complete spinal subarachnoid space block was present and at operation the spinal cord was found to be compressed by the fractured twelfth thoracic vertebra. The dura matter was thick; the arachnoid was thickened and inseparable from the underlying traumatized spinal cord.

Loss of the abdominal reflexes and a loss of sensation over the abdominal wall corresponding to the sensory distribution of the segments involved are characteristic of lesions in the lower half of the thoracic spinal cord. Since the upper halves of the abdominal recti muscles are innervated by the eighth to tenth and the lower halves by the tenth to twelfth segments, Beevor's sign may be present. If the patient raises his head from the bed, with his arms at his sides, the umbilicus is pulled upward if the lesion is at the level of the tenth segment because of the paralysis of the lower halves of the recti. Likewise, the upper abdominal reflexes on one or both sides may be preserved while the lowers are absent.

Girdlelike root pains are most frequent in injuries of the midthoracic vertebræ.

Injuries of the lumbar vertebræ have occurred in each of our cases as the result of falling from horses; being thrown from automobiles, or jumping from a height; but in each instance the force of the injury has been received on the buttocks or the extended lower extremities. The spinal cord ends opposite the superior border of the second lumbar vertebra and below that level the spinal canal is occupied by the cauda equina. Consequently, the symptoms of a lower motor neuron lesion are frequently characteristic of an injury to the lumbar vertebræ. Flaccid paralysis, loss of the deep tendon reflexes, muscle atrophy, reaction of degeneration and loss of sensation in the area of distribution of the lumbar and sacral segments are the usual symptoms. However, because of the nature of the cauda equina, involvement of motor and sensory function may be very asymmetrical in the lower extremities. In one of our patients who had a compression fracture and an anterior dislocation of the first lumbar vertebra, the most extensive sensory loss was in the second and third lumbar skin segments on the left side. Likewise, many of the muscles of the right leg continued to react to the faradic current, whereas in the left leg faradic reactions were completely lost.

Retention of urine and incontinence of feces are prominent symptoms. Excruciating pains in the back, or radiating pains into the perineum, genitals, and often down the posterior surfaces of the thighs occur frequently as the result of root irritation produced by the fragments of fractured bone.

There are two problems which must be solved in the decision for or against surgical intervention in fracture-dislocations of the spine. First, is there a demonstrable block of the subarachnoid space, which means compression of the spinal cord? Second, is there x-ray evidence of bony encroachment upon the spinal canal? Positive evidence of subarachnoid block usually implies bony encroachment on the spinal canal. It must be emphasized that a complete anatomic lesion of the spinal cord cannot be differentiated from a complete physiologic section. Therefore, unless one has inspected the cord at operation there can be no justification for the assumption that the cord has been divided completely. Surgical intervention may be useless and often harmful in the presence of a complete transverse anatomical lesion of the spinal cord but, as has been pointed out, a complete transverse physiological lesion may be present from compression by a dislocated vertebra. It would appear that the benefit which may be derived from operative interference is based simply upon the question of whether or not there is pressure upon the cord by a dislocated vertebra or fractured fragments of bone. In the presence of such pressure there is no question as to the benefit to be gained by an operation. Perhaps the most valuable aid in addition to the x-ray and a careful physical examination is the employment of the Queckenstedt test of pressure upon the jugular veins.

Compression of the jugular veins in the neck of a normal individual causes a definite prompt rise in the intracranial fluid pressure (Queckenstedt's sign). This rise in pressure is transmitted normally to the fluid in the spinal subarachnoid space. Release of jugular compression in normal subjects is followed by a prompt return of the pressure to approximately its original level. When, however, this increase in pressure does not take place on compression of the jugular veins, it is indicative of an obliteration of the spinal subarachnoid space. Cases of partial block may be recognized by the slowness with which the pressure changes in the spinal system after compression of the jugular veins; the less than normal rise produced, and the comparatively long time it takes for the pressure to return after release of the jugulars.

Often the character of the dislocation or rotation of the fractured vertebra as shown upon the x-ray films is in itself sufficient indication for surgical intervention. However, occasionally, symptoms of cord injury may be present in the absence of x-ray evidence of bone pathology. In such instances we have come to depend entirely upon the presence or absence of a subarachnoid space block and in each of our patients operated upon a manometric block was demonstrated. It is justifiable to perform successive Queckenstedt tests to follow the persistence or disappearance of the block. This is true particularly if there are clinical evidences of improvement in the symptoms. Likewise, in the presence of demonstrable x-ray evidence of bone pathology and in the absence of a subarachnoid

space block, one is justified in waiting for a spontaneous improvement of symptoms. In other words, the demonstration of compression of the spinal cord is the indication for surgical treatment and not the supposed extent or character of the spinal cord damage.

The mere fact that there are signs of neurologic damage in injuries of the spine does not, however, constitute a surgical indication. In cases of spinal injury with minor neurologic symptoms, or signs of a recovering lesion, and no evidence of subarachnoid space block, treatment by the usual orthopedic measures is probably the method of choice.

With manifestations of neurologic involvement of a definite degree, where there is compression sufficient to cause a subarachnoid space block, there exists a definite indication for laminectomy. It is conceivable that certain cases may present themselves with major neurologic signs and x-ray evidence of severe bone injury (crushing and fragmentation with spicules driven into the spinal canal) which do not give evidence of a block on manometric study. These cases should certainly be operated upon.

There remain some patients who have a questionable amount of permanent neurologic damage, questionable block, and questionable x-ray evidence of encroachment upon the spinal canal. It is in these cases that perhaps the definitive judgment of the neurologist and surgeon is tested to its utmost. With these patients it is probably better to err on the side of a possible unnecessary operation.

With the knowledge that the spinal cord does not regenerate once it is anatomically severed, even if one believes in certain cases that the displacement and fragmentation of the bone has been so great as most certainly to transect the cord, these patients should not be denied an opportunity for recovery. In some, recovery will occur when the pressure is relieved, and no one can tell by clinical examination alone that a complete irreparable lesion is present.

Occasionally a patient presents himself with evidences of spinal cord damage at a time after the injury to the spine when the bony damage has completely healed. The question of surgical intervention in these cases is at times a delicate one. Here so much depends upon the nature of the lesion, the degree of disability it is causing, and the course of its progress that no inclusive rules can properly be laid down. In these cases every effort should be made to arrive at an accurate pathologic diagnosis before submitting the patient to an operation. Then probably only those cases with lesions which offer some chance for surgical relief should be operated upon.

The time of operation after receipt of the injury is important and is dependent upon the demonstration of a subarachnoid space block in addition to the physical condition of the patient. One may with justification wait for several hours until the immediate state of general shock has subsided before a laminectomy is performed; but this period should not be extended to the point of waiting for the cessation of symptoms of improvement in the presence of a block. Though considerable recovery may occur spontaneously, the mortality of the operation of laminectomy in competent hands is too low to justify such conservatism.

*First-Aid Care.* It is imperative that trauma to the spinal cord be recognized at the scene of the accident because careless transportation may be responsible for irreparable damage to the spinal cord. The public must be instructed that an injured patient unable to move his arms and legs or legs alone should not be moved except under the direct supervision of a doctor.

Attempts to lift the patient's head to enable him to drink water, thus flexing the chin onto the chest in the presence of a fracture-dislocation of the cervical vertebræ may destroy whatever cord function remains. If the patient can move his arms, hands, and fingers freely, but is unable to move his legs, he may be rolled over face downward, without lifting on the presumption that the thoraco-lumbar region is injured. If the arms and legs are paralyzed, the patient should be moved cautiously by three or four persons; one exerting gentle traction on the head and one on the feet while the others carry him, lifting beneath the shoulders, trunk, and hips.

In all cases the back should be carefully supported. If transported on the back, a rigid stretcher or even a solid one is better for these cases than a soft bed, in which they may sink and thus increase the fracture deformity. In fractures of the cervical spine, the head should be kept as if of one piece with the shoulders when moving or turning the patient. If these

precautions are rigorously observed, the injured patient may be transported in safety.

GENERAL TREATMENT

*Care of the Urinary Bladder.* The care of the bladder in these cases is a question concerning which there is probably more discussion and less unanimity of opinion. For a better knowledge of the subject it is well to understand the mechanisms behind the production of the so-called cord bladder. The neurogenic bladder may be defined as a bladder malfunctioning because of a derangement in the normal physiologic nervous mechanism which controls the emptying and filling of the organ. Because of the disruption of this mechanism in injuries of the spinal cord one is faced with various types of malfunction. There may be complete incontinence or retention with overflow. In some cases a so-called automatic bladder may develop, with more or less complete evacuation at intervals.

It must be remembered that the innervation of the bladder is all derived from the lower lumbar and sacral levels of the cord and that theoretically there may not be so much interference with bladder function in cord lesions above this level except for the loss of voluntary control over voiding. Practically, this works out in a satisfactory manner in handling the bladder disturbances of these patients. Centers in the sacral region of the cord below the site of the lesion keep up a slight tonus in the detrusor, and apparently give rise to an automatic voiding reflex when the bladder becomes distended. While much weaker perhaps than the normal voiding reflex, this reflex may be increased by stimulations reaching the cord below the level of the lesion. This accounts for the emptying of the bladder as part of the mass reflex excited in some complete lesions of the cord by pinching or stroking the legs.

Urinary infection alone will prevent a return of function in the spinal cord. The bladder should not be allowed to distend until overflow occurs and dribbling takes place. The stagnant urine distends an already paralyzed bladder wall beyond the possibility of recovery of its contractile power. Further, an ascending urinary tract infection occurs which endangers the life of the patient, and his possible chances for recovery. Likewise, frequent catheterizations cannot be performed without traumatizing the urethra and, even in the most careful hands, introducing the danger of infection. Therefore, a retention catheter should be introduced and left in the bladder for from ten days to two weeks at a time. A clamp should be applied and opened at intervals of four to five hours, depending upon the rapidity with which the bladder fills. This procedure will aid materially in establishing an "automatic bladder." The bladder may be irrigated daily with warm boric acid solution. Experience has shown that the use of the retention catheter is the most successful method of preventing urinary sepsis. In cases which are operated upon after urinary infection has occurred, a suprapubic cystostomy may be the only means of treating a serious bladder infection.

*Decubitus Ulcers.* It is extremely important to guard against decubitus lesions of the skin in the anesthetic areas of the body and extremities. The most successful method is to place the patient upon a water or air mattress which allows an equal distribution of the patient's weight. As has been pointed out, the loss of sensation is variable as a result of spinal cord lesions and involvement of the cauda equina is characterized commonly by sensory loss about the buttocks which has given rise to the term "saddle anesthesia."

The skin must be kept scrupulously clean and dry. Alcohol rubs and the application of cocoa butter should be given freely. As soon as is deemed wise, the patient should be turned on the side and propped there by pillows, so that strain on the paravertebral muscles is avoided and the same relative position of the spinal column is maintained. Harsh, stiff linen sheets which burn the skin must be avoided. The linen should be changed immediately if it becomes soiled from an incontinence of urine or feces. Nurses should be instructed about the ease with which hot water bags may produce blisters of the insensitive skin, which are commonly the beginning of a large spreading ulcer.

If they develop or are already present, decubitus lesions may be treated with excellent results by daily exposure to ultraviolet light. The necrotic edges of large ulcers should be débrided and all undermining pockets of necrotic tissue removed. The combination of Dakin's solution

irrigations and dry heat are also efficient in the treatment of this type of lesion.

*After-care.* The aim of treatment of spinal cord injuries should be to restore the patient to an economic and social independence. It is a common error to look upon the disabilities which result from these injuries as hopeless. Many of the crippling deformities and contractures which are observed commonly after injury to the spinal cord can be entirely avoided or to a great extent improved.

Gentle massage of the muscles, the use of radiant heat, and the whirlpool bath are all agents which have proven helpful. Passive movements may be carried out very well in conjunction with massage. They help to stretch contractures which have already occurred and to prevent those which invariably occur in an inactive or denervated muscle. They also increase the range of motion in an already stiffened joint and help to keep a mobile joint active so that when the time comes it is ready to perform its part as an effector mechanism. Such movements help to re-educate the muscles in performing normal movements. These exercises should be carried out slowly, gently, and never with quick, jerky movements. Each separate passive exercise should be individualized, and the patient be required to make the attempt to perform the movement simultaneously or to attempt to hold the part in the position imposed upon it.

The use of electrotherapy in spastic paraplegic patients accomplishes very little as compared to the results which may be obtained in the flaccid paralyses. Electrotherapy is indicated to prevent the atrophy of muscles and fibrosis, to increase nutrition and to conserve the functional capacity of paralyzed muscles until sufficient return of function has taken place to permit of active motion.

Splints have been found of little or no use in the treatment of spastic paralyses in the lower extremities. Deformities and contractures may be prevented in part from developing by massage and passive movements of joints. When the patient is confined to bed the extremities should be kept in extension and in abduction by the use of sandbags and pillows. The tendency for these patients to lie upon their sides constantly, with the extremities flexed, must be prevented. On the other hand, marked flexor and adductor reflex spasms may occur in spite of all efforts to prevent them. Constant supervision and careful nursing may prevent the grotesque, disabling deformities which may otherwise occur. When contractures have developed splinting is of little value, and operative intervention is indicated. Section of the obturator nerves, posterior root sections and tendon divisions have been employed in these cases to make the patient more comfortable, and his nursing care less laborious.

Much can be done by the intelligent use of splints in cases of flaccid paraplegia. While the patient is in bed, foot drop may be avoided by the use of sandbags against the soles of the patient's feet and a cradle over the legs to keep the weight of the bed clothes off the feet. These require careful and constant adjustments, and it may prove more desirable to use light crinoline posterior molded splints which may be removed easily for massage and passive movements.

When the patient becomes ambulatory the most satisfactory splint to prevent foot drop is a simple one which can be attached to the shoe easily. As is usually the case, the remainder of the extremity also requires support. A modification of the Thomas caliper splint may be employed; a spring lock at the knee joint enables the patient to flex the knee when he sits. When he is standing or walking this lock closes and the knee is kept in extension. The additional foot drop splint may be attached very simply to this type of apparatus.

*Exercises and Muscle Re-education.* Very often the paraplegic patient is looked upon by his physician as hopeless. Many times massage, active and passive movements, electrotherapy and splinting may be carried out quite effectively until the patient is ambulatory. It is necessary to teach him to use his recovering muscles to his best advantage. He must be taught to walk again. While one may feel that this will be accomplished gradually in spite of what may be done, there is no question but that progress has been more rapid as the result of directed muscle exercises and re-education.

One of the simplest devices to teach the patient to use his extremities may be made of small iron pipes and is similar to a baby's "walker." The patient stands within this frame, which is on rollers, and rests his weight upon his arms, which grasp its sides. Another excellent method

of re-education in walking is to have the patient walk in an aisle bounded by iron pipes, which may be grasped easily, and upon which he may rest his weight as he progresses. The floor of this aisle consists of a board upon which are painted numbered square spaces, varying in size. The patient attempts to place his feet within these spaces and as he progresses the wider spaces are utilized. The results of this method may be increased by having the patient observe the movements of his legs in a mirror.

It has also been found that the movements of the lower extremities may be performed more easily in slightly warmed water. This is true of the spastic as well as the flaccid paralyses. A Hubbard tank is an excellent means of carrying out these under-water movements. This may be installed in the basement of the home at relatively little expense, and is extremely valuable.

The few examples given of methods of re-education of the muscles of the lower extremities can be multiplied many times. In more advanced cases a stationary bicycle may be used or a rowing-machine employed to advantage. Just as in the re-education of the upper extremities, educative exercises which are productive intrigue the patient, and secure his whole-hearted co-operation.

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## THE IMMEDIATE TREATMENT OF COMPOUND INJURIES

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In the management of any injury the goal of surgical treatment is the functional and if possible morphologic restoration of the injured part. The open wound differs in but one respect from the closed wound, that is the solution of continuity of an epithelial surface and the contamination of the deeper tissues with pathogenic microorganisms from without. The presence of contaminating and possibly highly virulent micro-organisms is of such great significance, and the infection which may follow, if these organisms gain a foothold, is so disturbing to wound healing that the surgeon feels justified in taking every possible measure to rid the wound of bacteria. It is only natural that with the epoch making development of the science of bacteriology the healing of open wounds came to be thought of in terms of bacterial contamination, and an operation in surgery as an experiment in bacteriology. The great improvement which followed the introduction of Lister's methods in the treatment of compound wounds justified this attitude and antiseptic surgery became established. Attention was thus focused upon antiseptics and although in clean surgery asepsis gradually replaced antisepsis, the surgery of open wounds remained for a long time antiseptic surgery. Carbolic acid was replaced by tincture of iodine, and tincture of iodine now competes with dozens of different highly colored or artificially colored chemicals, each claiming superiority mainly on the grounds that it is more efficient in higher dilutions and less irritating to body tissue than any other agent. This very attempt to produce a non-irritating antiseptic should of course have given us a clue to the solution of the problem. It took the world war, however, to drive the lesson home, for whereas in the early years of the war antiseptic surgery was practiced and open wounds were filled with all manner of tissue destroying chemicals; toward the close of the war wounds were cleansed, debrided and closed. Aseptic surgery had replaced antiseptic surgery in the management of open wounds and with this came an appreciation of other factors than that of bacterial contamination in the healing of wounds.

If in our management of the open wound we keep before us the concept that our goal is healing and functional and morphologic restoration, the requirements for good wound surgery assume their proper relationship. In all of the various steps in the treatment of the wound, we should do nothing that interferes with the natural processes of tissue repair. In no way should we traumatize, irritate or lower the vitality of the living tissues, whose healing we are trying to promote. This principle which is the first law of surgery—above all to do no harm—must guide use in every step of the management of the wound.

What are the requirements of the surgical management of open wounds in the light of our proposed goal of functional restoration? They may be listed as follows:

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1. To remove contaminating microörganisms and foreign material.
2. To remove obviously non-viable tissues.
3. To avoid additional trauma and irritation.
4. To repair injured tissues and obtain anatomic restoration.
5. To close the wound.
6. To put the part at rest until healing has occurred.

The removal of contaminating microörganisms and foreign bodies must be accomplished before the bacteria have had a chance to proliferate and invade the tissues. Before bacterial proliferation has occurred the wound is merely contaminated and it is possible to cleanse it of the accidentally introduced bacteria. After bacterial proliferation and tissue invasion occur, the wound is infected and the opportunity for cleansing and primary repair has passed. Therefore, if we wish to cleanse the wound of the accidentally introduced organisms, we must do so before infection develops. Experimental evidence and experience with wound surgery have shown that approximately 6 hours are required for bacteria to acclimate themselves to living tissues, they lie on tissue surfaces and are bathed in body fluids, but growth and invasion are in some way retarded. After this period of 6 hours has elapsed, the wound can no longer be considered as merely contaminated, it is now infected and the possibility of ridding it of bacterial invaders is past. This distinction between contamination and infection dominates our concept of wound surgery.

The removal of contaminating bacteria is best accomplished by the simplest and least traumatizing means we have at our disposal—mechanical cleansing with liberal amounts of soap and water. Chemical antiseptics cannot be depended upon to do it. To be efficient as antiseptics they must be protein poisons and as protein poisons they irritate and damage the delicate living tissues whose healing we hope to promote. They give a false sense of security, their brilliant colors cover up dirt and frequently stain tissues beyond recognition, and dependence upon them leads to neglect or incompleteness in the cleansing and excision. They are unnecessary and definitely harmful and their thoughtless and extravagant use has occasioned a tremendous amount of pain and suffering and favored retardation of healing and the development of infection in many wounds which should have healed by primary intention.

The cleansing of the wound with soap and water must be accomplished with the same thor-

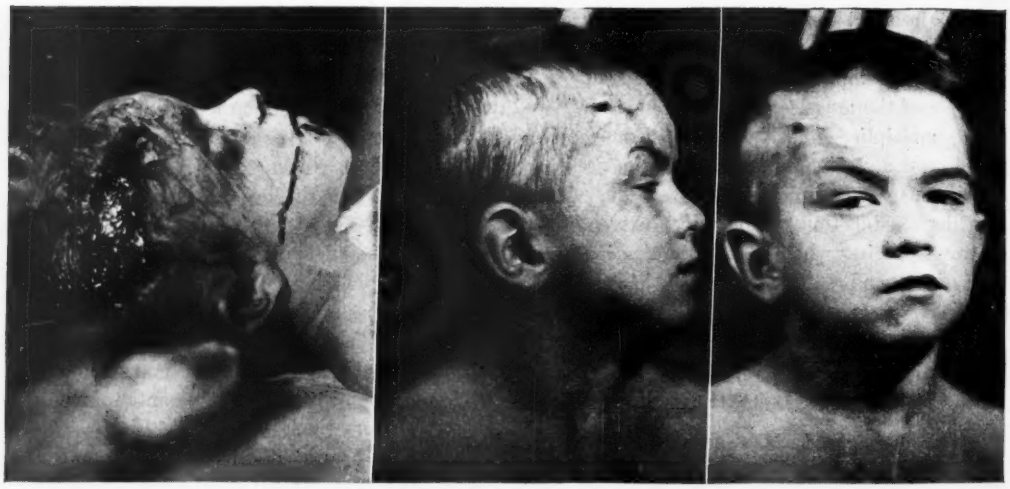

Fig. 1. R. K. Laceration and abrasion of forehead, eyebrow, right temporal and parietal regions, of lower lip and chest. Street injury, wounds badly contaminated with street dirt and soil, skin edges crushed and devitalized, especially in scalp. Wounds washed with soap and water, devitalized skin excised and primary closure performed. Irregular crushing and skin loss in scalp necessitated considerable excision and occasioned difficulty in closure. Healing without infection.

A. At time of Injury.

B. & C. 1 month after cleansing and primary repair. Healing without infection.

oughness and care that the surgeon uses in washing his hands previous to an operation. It must not be done perfunctorily as something which must consume a certain number of minutes, but must be carried out thoughtfully and carefully as the most important single step in the care of the wound. It is sufficiently important that the surgeon can seldom relegate it to others but must carry it out himself.

A definite order should be followed in washing the wound. The first step is the cleansing of the surrounding skin. The wound itself is covered with a dry sterile dressing, and the surgeon, wearing sterile rubber gloves, thoroughly scrubs the surrounding skin, taking care that none of the water from the skin gets into the wound. The scrubbing should be done with cotton or washed gauze, not with a brush; liberal amounts of soap and water used, and an ample operative field prepared. After the skin has been cleansed and rinsed, a process which requires from 10-20 minutes, the gauze is removed from the wound which is then thoroughly and gently cleansed with soap and water. Visible foreign bodies are picked out with sterile tissue forceps, and the edges of the wound gently retracted so that every corner of it is properly cleansed. For the final rinsing liberal amounts of warm normal saline solution may be run gently through the wound with an irrigation nozzle or syringe.

The soap and water cleansing, which consumes from 20-40 minutes, if carefully and thoughtfully performed, leaves us with a wound which is surgically clean. It is doubtful if we ever succeed in removing all bacteria from a wound, although unquestionably many wounds are actually free of bacteria at the completion of the cleansing. However, the experiments of Meleney have shown that even the clean operative wound probably contains a few bacteria after the completion of an operation. If given a chance, however, and if not handicapped by chemical and mechanical trauma, living tissues can cope successfully with a minimum of contamination.

The wound having been properly cleansed, badly traumatized and devitalized tissues should be excised. This is the next most important step in the procedure and requires the most careful judgment, since neither should we remove viable and functioning tissue nor should we allow to remain tissues which will become necrotic. Before healing can take place necrotic tissue must either be absorbed or extruded; tissue repair is disturbed and infection frequently supervenes. Complete excision of a wound is rarely possible except in quite superficial injuries involving mainly the skin and subcutaneous tissues and even then, if the face or finger tips are involved excision must be strictly limited to non-viable tissue.

The crushing injury obviously offers a more perplexing problem than does the lacerated wound, more perplexing in that the amount of devitalized tissue is greater, and the delimitation of normal from injured tissue is often very difficult. The crushed tissues are not necessarily entirely dead but their vitality is lowered and with the development of edema and concurrent venous congestion; tissues, which at first appeared to be living undergo necrosis and fall prey to infection. In the badly crushed wound it is necessary to perform a much more radical excision than in the lacerated or incised wound. Excision of the deeper tissues must of necessity be a piece-meal procedure and should be done slowly and cautiously to avoid damage to important nerves, tendons and blood vessels. In wounds of the hand especial care should be taken to avoid injury to important anatomic structures. The most difficulties concerning viability are offered by flaps of skin thrown back or raised from their subcutaneous beds. If necrosis occurs in such a flap even the most perfect nerve, tendon and bone repair is ruined, infection is certain to develop and the purulent granulating surface left by the skin slough may require weeks of care before secondary skin grafting can be done. Our judgment as to the viability of a skin flap is based on an estimate of the amount of crushing which the flap has sustained and the degree of impairment of its blood supply. Severely crushed and abraded flaps of skin, especially if the blood supply has been seriously interfered with are almost certain to become necrotic and must be sacrificed. However, large skin flaps may often be saved if they are not crushed and if the blood supply has not been too seriously damaged, providing infection, edema, venous congestion and hemorrhage do not occur. It is largely a problem of circulation and infection, over both of which factors we have a certain amount of control. By careful cleansing and

gentle handling of the wound we reduce the dangers of infection to a minimum. Hemorrhage and venous congestion may be prevented by careful hemostasis and the application of a pressure dressing. A snug but not too tight pressure dressing, which may be obtained by means of a sea-sponge, will prevent oozing from raw surfaces, discourage venous congestion, and frequently will save a skin flap which would otherwise become necrotic.

After the wound has been carefully cleansed and devitalized tissue excised the repair of injured and divided structures may be accomplished. In doing so, as in all steps of the operation, we must avoid further traumatization of the already injured tissues. Careful and atraumatic surgery are required here as in any type of operative repair, since not only must the tissue cope with the process of healing but often with bacterial invaders as well. Rough retraction, the grasping of large amounts of tissue in large heavy hemostats, the use of heavy coarse suture material and rough tugging and clamping add greatly to the burden which the tissue must bear. Not only is the tissue vitality lowered by such handling but there are left behind numerous areas of necrosis which form excellent media for bacterial growth and seriously interfere with the natural process of repair. A thorough hemostasis should be secured as carefully and atraumatically as possible. The bleeding vessels should be grasped with small hemostats, catching only the vessel itself and ligated with very fine ligatures, the ends of which are cut very short. Firm pressure for a few minutes will frequently control bleeding from freshly cut surfaces while a snug pressure dressing applied after the wound is closed will usually control the post-operative oozing.

In performing the repair of injured tissues a minimal amount of foreign material should be left within the wound. The repair of divided nerves and tendons should be accomplished by means of the finest silk that will hold the divided ends together. Metal plates, screws and pegs should be avoided in the repair of compound fractures. Heavy cat-gut, thick braided silk and kangaroo tendon have no place in the surgical treatment of open wounds.

It is not necessary to go into detail concerning the actual methods of repair of the various tissues. It is my feeling that in the majority of instances primary repair of nerves, tendons, bones and joints can be safely performed provided the patient is seen within six hours of his injury and provided the soap and water cleansing has been faithfully carried out and satisfactory removal of devitalized tissue accomplished. This repair must be done accurately and atraumatically. The injured structures should be handled gently, and with respect. They must not be crushed with heavy hemostats, or tissue forceps, nor should they be repeatedly punctured with large needles and burdened with thick, heavy sutures and large irritating knots. The surgeon who undertakes repair of nerves and tendons and compound fractures should be familiar with this type of surgery and should be adequately prepared to deal with whatever situation presents. Repair of nerves, tendons and open fractures cannot be undertaken in an ill-equipped emergency room, without assistants and without a competent anesthetist. Where for some reason satisfactory repair cannot be carried out, it had best be left undone, the wound should be closed and allowed to heal, and secondary repair undertaken at a later period under more favorable circumstances.

After deep repair has been accomplished the wound should be closed, either by suture or skin graft as soon as it can be done with safety. Far from inviting the development of infection, primary closure is our best insurance against it. The clean operative wound is not left open, neither should the clean traumatic wound be left open, but should be closed as carefully as is an operative incision. The introduction of drains, packs and numerous lengths of rubber tubing into a wound which might have been closed primarily may lead to months of disability, sepsis and irreparable functional loss. If there is doubt as to the thoroughness of the cleansing, if there is question as to whether the wound is surgically clean, if there has been a severe crushing injury and tissue of doubtful vitality and questionable blood supply has been left the surgeon may delay closure for 24 hours. Such a wound may be lightly packed and a delayed primary suture performed the following day.

If because of loss of skin, suture of the wound is not possible, primary closure by means of a skin graft, is indicated. Usually a split graft,

preferably the graft of intermediate thickness of Blair and Brown will answer the purpose. At times a free full thickness graft is applicable, however, the split graft usually meets most requirement. A pedunculated flap may be required in instances in which, because of exposure of tendons, the bed is unsuitable for the application of free grafts. The immediate raising and application of pedunculated flaps, however, even under ideal conditions, is somewhat precarious, and unless we are forced into it the free graft is preferable.

The wound cleansed, debrided, deeper structures repaired and the skin closed, the part should be put at rest until healing occurs. While the value of rest and splinting are never questioned in the case of fractures and dislocations, we too often forget them in the care of soft tissue injuries. Simple rest secured by means of a splint or cast or by putting the patient to bed will hasten recovery and may be the factor which determines whether a wound heals by primary or secondary intention. The necessity for relaxation splinting following suture of nerves and tendons cannot be too strongly emphasized. Suture of nerves and tendons, a procedure, which may require three or four hours of careful work, is entirely ruined if the hand is not properly splinted until firm union has taken place. Intelligent and purposeful splinting is essential to good wound surgery, at times it may be the most difficult part of the procedure and may sorely tax the surgeon's ingenuity.

*Resume.* In the management of the open wound, every effort should be made to promote healing and functional recovery. Chemical and mechanical damage must be avoided since they retard repair and favor infection. The wound, seen within four to six hours, should be carefully cleansed with soap and water, devitalized tissues excised, deep structures repaired, and the skin defect closed by primary suture or skin graft. Following this the part should be put at rest until healing has taken place.

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## DISCUSSION ON PAPERS OF DRS. LOYAL DAVIS, and MICHAEL L. MASON

Dr. Wm. R. Cubbins, Chicago: In discussing Dr. Davis' paper it seems to me that he has made a very important statement in emphasizing the necessity of differentiating between physiologic loss of function and a loss of function due to a complete severance of the cord. There are too many surgeons who are not considering these lesions in this light.

In relation to Dr. Mason's paper, we have carefully studied 95 cases of compound comminuted fractures, in which alternate cases were treated with soap, water and normal solution; the others with various types of antiseptics, particularly iodine. The soap, water and normal salt treatment gave 20% better results, in so far as clean wounds were concerned, than any other antiseptic.

Regarding the tight closure of wounds, it is necessary to differ with Dr. Mason's conclusions. We grant that it may be possible to close firmly a small, compound wound. On the other hand, it is disastrous to close a large compound lacerated wound in the lower extremity in such a fashion that the enormous amount of fluid that is thrown to these parts cannot be extravasated into dry fresh dressings. When this cannot be done, it is extremely common to have the edges of the wound completely necrotic, due to the pressure caused by this fluid; and it is not uncommon where a wound in the lower extremity is closed firmly to have an interference with the circulation. For these reasons, we close our compound wounds loosely with a stitch to about every inch or inch and one-quarter; with frequent changes of dry dressings a maximum capillarity is maintained. When the fluid ceases to be extravasated the dressings are allowed to remain in place until the time arrives for the stitches to be removed.

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# HYPERVITAMINOSIS-D

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The recent reports on the use of massive doses of vitamin D in arthritis and allergic conditions, prompts this review of the literature pertaining to the possible effects of toxic dosage, vitamin D poisoning and hypervitaminosis-D. It is hoped that this effort will instill a measure of caution in those physicians who do not have adequate facilities for the observation and control of patients suffering from these conditions and in whom a trial of this therapy might be considered.

As is usual, the advocates for any particular type of therapy, this one no exception, extol its virtues but have a tendency toward minimizing any deleterious effects. Animal experiments offer evidence that a span of 4 to 6 years is not enough time to draw competent conclusions as to these effects in the human. Furthermore,

these advocates frequently have the advantage of institutional facilities which provide them with every means for a complete control over the patient so that any undesirable change can be noted and steps taken to offset this where possible. This is not always true of the physician in general practice, who is often the first and sometimes the only one to see these cases, treating them in their homes.

It is also possible that harm may result from indiscriminate vitamin self medication on the part of the laity. Vitamin D preparations of all potencies have been greatly over-emphasized and over-sold to the public. This has been done through every medium of sales and advertising the agile minds of sales counselors can devise. The over-commercialization of these products, which we are only now recognizing as having undesirable qualities along with their beneficent properties, may have most unfortunate repercussions as time goes by.

In the reported work on the toxic effects of vitamin D (Agduhr, Pfannenstiel, Krietman and Moll, Tamman) it was established that this "hypervitaminosis-D" causes extensive abnormal deposits of lime in the arteries, myocardium, lungs, kidneys, stomach and intercostal muscles; the animals suffer from loss of weight with debility, anorexia and diarrhea, finally dying from this condition. The first signs of overdosage (Stepp) in omnivora, appears as a marked hypercalcemia; in herbivora an equally pronounced hyperphosphatemia. Outstanding changes are, namely: rough hide, weight loss and gastrointestinal manifestations. There is a supermineralization of the bones at the outset, finally a decalcification of the subepiphyseal spongiosa with calcium deposits in the various organs, as for instance in the large vessels, heart, kidneys and further to nephritic and uremic symptoms, thought to be due to a toxicosis from proteid disintegration.

Weinman noticed changes in the bones caused by the toxic condition of hypervitaminosis-D. He found a remarkably large number of "osteoblasts" and areas of abnormally heavy calcification in the new formed bone tissues. Collazo and his collaborators observed a marked increase in the new formation of bone leading finally to a complete transformation of the spongious osseous tissues in the epiphyses and other adjacent parts of the diaphyses into compact bone, and in addition, a premature calcification in the proleferative zone of the cartilage with an elimination of the normal osteoid tissue. Schmidtman observed similar changes involving even the complete disappearance of the "Cartilaginous cell columns," also that the bone marrow was hyperemic. In his experiments with excessive doses of vitamin D he also noticed in older animals a transformation of the bones, making them softer and thinner and changing the compact bone into spongious bone tissue. On the other hand Cornbleet and Struck believed that calcium was removed from the skin in scleroderma before any appreciable amounts were removed from the bones and that massive doses of vitamin D produced a balance apparently at the expense of the calcium deposits in the collagen and muscle. Harris and Innes noticed in hypervitaminosis-D a stimulation of the osteogenesis, a very marked calcification of the bones and also—like Schmidtman—a calcium absorption from the bones on excessive overdosage; a condition of osteoporosis with lively "osteoclastic" breaking down of the bone and cessation of further bone growth. The severity of these changes is further increased with an increase of the calcium and phosphorus supply (Harris & Innes), while these changes can be made to subside by a reduction in the amount of these minerals in the diet. Stepp states that under calcium poor, or free feeding, the organic calcification and hypercalcemia are less marked but still evident, which proves that the superfluous blood calcium comes from the bones. As early as 1922 Mouriquand and Michel published a paper in which they gave an account of some experiments with administration of large doses of cod liver oil (2.5 cc. daily) to guinea pigs, whereby these animals died presenting on autopsy, some distinctly scorbutic changes in the bones. Hertz questions their experimental results and it was admitted later by Mouriquand that this deleterious effect of the cod liver oil appears only when the salt content of the diet, especially the calcium content and also the amino-acid content are inadequate.

Another symptom of hypervitaminosis-D is an action upon the fat metabolism as emaciation, lipoid infiltration of the liver, arterial wall and endocrine glands (Collazo). From the hypodermic injection of larger doses of vitamin D local calcification may develop, as a specific effect of the vitamin (Brand, Holtz). In a general way it may be said (Stepp) that the oxi-

dative processes of the organism are increased by physiological quota of vitamin D. That is supported among other things by the observation in animal test feeding of vitamin D, the blood catalase rises, but is lowered by overdosage (Jusatz). Following vitamin D administration the quotient "carbohydrate/lactic acid" rises in the blood in a like manner. In vitamin D poisoning the decrease of glutathione is looked upon as an expression of a disturbance of oxidative metabolism (Hesse).

Windaus, Von Werder and Luttringhaus point out the presence in irradiated products of a substance called toxisterol and state that it may be of harmful nature far beyond its therapeutic worth. Laquer and Linsert state that toxisterol is present in any product that is irradiated in this way. This is confirmed by Reerink and Van Wijk. Rider and Sperti hold that toxisterol may be filtered out by selective irradiation. Stepp considers that the theory of toxisterol being the only harmful factor erroneous and states that it was found that large doses of vitamin D also showed toxic effects. The pure vitamin D is merely less toxic than the irradiated substances. He further states that the anti-rachitic action of the latter cannot be separated from the toxic effect ascribed to the so-called calcinosis factor. That factor according to Holtz, is measured by toxic marginal doses, and they are that smallest daily dose which under certain conditions produce a reduction of weight or death in test animals, the mouse in this case.

In the cases where a hypervitaminosis-D in man was observed (Stepp), the over-dosage proved itself in anexoria, loss of weight, digestive disturbances and nephritic symptoms. Dreyer and Reed, Farley confirm these findings. Vrtiak and Lang observed nausea in all of their patients on high dosage of vitamin D, Steck, Deutsch, Reed and Struck state that hypervitaminosis-D may produce symptoms of hyperparathyroidism, extensive calcium deposits in various tissues and other pathologic changes. They believe the process is reversible and reparable if administration is discontinued, but neither animal nor human subjects have ever recovered the toxic condition while administration is continued. Hathaway et al, state they had given up to 3,000,000 units of vitamin D daily for short periods to humans. They found that the first manifestation of toxic effects is destruction of individual tissue cells which may appear in any tissue but are probably more numerous in the kidney. Symptoms of toxicity appear at this time. Calcification does not occur until after this stage and first appears in the sites where the cells have been destroyd. They believe cessation of administration of the vitamin allows injuries to be repaired with no deposition of calcium or only a transient deposition that is promptly removed. In any event they counsel its contraindication where there is kidney pathology and in people in advanced years. Wyatt and co-workers believe the presence of a very sensitive colon contraindicates its use. Stepp has found that the toxic dose in animals is one thousand times the curative and states that 40 or several times 100 fold of a therapeutic dose were given for weeks without a disturbance having appeared. The approximate marginal dose from which, by its daily administration for weeks, symptoms arise, amounts to about 200 times the normal dose. According to Bills it seems that the margin between the ordinary and the toxic dose is less for man than the rat. Furthermore, it should be remembered that the rat is able to produce its own vitamin C in the intestinal flora, also by refection its own vitamin B, which leads to the consideration of other factors influencing hypervitaminosis-D.

Wilton has reported a very interesting observation concerning a child who was said to have been submitted to a very excessive overdosage of cod liver oil. In this child Wilton found disturbances in the enchondral ossification with abnormal areas of calcification in the proliferative zone of the cartilage, and also the absorption of the collagen. According to Wilton these disturbances remind a great deal of the changes that may be demonstrated in scurvy, and this leads him to the view that scorbutic changes may be produced in the organism by excessive overdosage of vitamin D.

Westin elaborates this idea to the extent that he claims there must normally be a balance in the organism between the available amount of vitamins C and D. A disturbance of this balance through the administration of toxic doses of vitamin D will therefore bring about the same changes as vitamin C deficiency, i. e., will result in scurvy; conversely the administration of large doses of vitamin C should produce the same

phenomena as vitamin D deficiency, changes corresponding to rickets. Mouriquand and Michel also had observed this antagonism between cod liver oil and the antiscorbutic factor. Hertz believes that these conclusions might probably go too far, but the idea as to there being some kind of interaction between the vitamins is not new.

Höjer shows the toxic changes demonstrated by Agduhr on administration of large doses of cod liver oil are really due to a condition of vitamin B deficiency, which is again responsible for the vitamin A having a toxic effect. Harris and Innes, Moore, observed they thought they were able to ascertain a "vitamin balance" between vitamin D and vitamin B, as massive overdosage would give rise to the same symptoms as are produced by vitamin B deficiency. The supplying simultaneously of the vitamin A and B complex causes the hypervitaminosis to set in later and less intensively, if at all, or would subside if these vitamins were added to toxic administered dosage of vitamin D. The quotient "carbohydrate/lactic acid" which is mentioned as being influenced by vitamin D administration is now shown by Peters to be directly influenced by vitamin B which is necessary for carbohydrate metabolism. Stepp claims the withdrawal of a vitamin from the food, or an excessive administration of a single vitamin, means an alteration of the other vitamins remaining in the nutriment. Thus the phenomena resulting from a lack of vitamin A corresponds in a certain degree to those produced by an over supply of vitamin D, and conversely. There seems to be, then, for the vitamins A and D, a condition of equilibrium which is indispensable for maintaining normal cell formation. This relationship exists not only between the fat soluble vitamins A and D but also between A and the components of the water soluble B complex and vitamin C. Higgins considers that vitamin A is important for proper cell metabolism in the kidney, helping maintain a stable colloid function, preventing pathological depositions. The hypervitaminosis-D causes a disintegration of proteins and becomes antagonistic to vitamin A thereby explaining somewhat the reason for the theory advanced that both proteins and vitamin A deficiencies are factors in the keratinization and calcification in the renal tract. Lee suggests that vitamin F can also be considered an important factor in calcium metabolism because it reduces blood calcium by increasing its diffusion to the tissues and cooperates with D by unloading the blood of its calcium load, probably mainly into the cells which are possibly the greatest consumers of this element in the matured human body. He proposes vitamin F might logically be considered a partial antidote to vitamin D poisoning.

## SUMMARY

There is an agreement by numerous investigators that hypervitaminosis D causes cell destruction and calcification which may become involved beyond repair, leading to death.

The factors influencing the severity of the hypervitaminosis-D are; 1. the state of kidney pathology previous to massive vitamin D administration, 2. the presence of a sensitive colon or intolerance to any dosage, 3. the proportionate available supplies of calcium and phosphorous, 4. the proportionate available supply of the vitamins having a cooperative or synergistic action, namely vitamins A and B complex ($B_1$ and $B_2$ or G), C and F.

In the absence of better diagnostic aids for the determinations of hypervitaminosis D than an inexperienced patient's self observation of distress, it behooves physicians to use extreme caution in making use of this therapy.

Medical Arts Building.

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# DIPHTHERIA PREVENTION—A MUNICIPAL PROBLEM

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The problem of diphtheria prevention in the State of Illinois has been left, to a great extent, to the individual city to be worked out to the best of its ability. A number of cities in this State have done a great deal in this respect while others have accomplished little or nothing.

Prior to 1930 diphtheria prevention constituted a minor role in the public health activities of a few cities in the State. Since this time several of the larger cities in the State have adopted diphtheria prevention as a major function in their public health program and their efforts are reflected in the morbidity and mortality records of the State as well as the individual cities. The morbidity rate for the State has been reduced from 218.9 per 100,000 as of 1920 to 33.5 in 1935 while the mortality rate has been reduced for the same period of time from 17.2 per 100,000 to 2.62. The attainment of a few individual cities in the State is even more remarkable than this and will be touched upon later.

In an attempt to evaluate and compare the results obtained with the methods used a questionnaire was sent to the local health officials of 25 cities in the State in order of their population. Such an astounding variety of answers and opinions were received that it becomes difficult to arrive at any definite conclusions.

For example, in answer to a question relative to materials used and the method of injections

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there were received from 16 cities answering the questionnaire the following ten different answers:

| Number of Injections | Amount | Material | Interval of Injection |
|---|---|---|---|
| 3 | 1 c.c. | Plain Toxoid | At weekly intervals |
| 3 | 1 c.c. | Plain Toxoid | 2 week intervals |
| 3 | 1 c.c. | Plain Toxoid | 3 week intervals |
| 3 | 1 c.c. | Plain Toxoid | 4 week intervals |
| 2 | 1 c.c. | Plain Toxoid | 1 week intervals |
| 2 | 1 c.c. | Plain Toxoid | 2 week intervals |
| 2 | 1 c.c. | Plain Toxoid | 3 week intervals |
| 1 | 1 c.c. | Alum Toxoid | ..... |
| 2 | 1 c.c. | Alum Toxoid | 1 week intervals |
| 2 | 1 c.c. | Alum Toxoid | 3 week intervals |

Some of the cities have changed from one material to another, one or more times, in the past six years while other cities are recommending no particular material or method of injection.

Judging from recent reports from various sources one is impressed with the importance of this one factor in the planning of any diphtheria prevention campaign.

Pansing and Shaffer[1] in a study conducted for the purpose of determining the degree of permanency of alum precipitated toxoid confirmed the findings of Fraser and Halpern[2], of the University of Toronto, Canada, that 3 doses of unmodified toxoid is distinctly better than the response to 1 dose of alum precipitated toxoid. In their study they found that 1 c.c. of alum precipitated toxoid gives an early and high immunity in 28 to 60 days after inoculation, but 57% lost this protection at the end of two years.

The work of Underwood[3], and Parish, Edin, and Wright[4] on the incidence of diphtheria caused by the virulent gravis strain of the diphtheria organism emphasizes the need of striving for the highest level of circulating antitoxin. They show that the usually accepted immunity level to antitoxin is not sufficient to protect against infection with this strain. Therefore, in choosing immunizing procedures it may not be enough simply to choose those that convert a reasonable number of Shick positive children to a Shick negative state.

Shaughnessy[5] very ably discussed this problem in a paper presented at the Illinois Conference of Health Officers in 1935 and stressed the importance of more investigative work along this line.

In attempting to analyze answers received from sixteen cities answering the above mentioned questionnaire it is also difficult to draw conclusions as to the most efficient method of conducting diphtheria prevention campaigns.

In two cities, including the city of Chicago where all the work is being done by the Board of Health, the results obtained have been remarkable while in two other cities using the same method of attack has failed.

Practically the same can be said regarding four other cities which have delegated this responsibility to the organized medical profession.

It is extremely difficult to lay down any hard and fast rules as to the particular type of diphtheria control program which would be best fitted to any individual community for there are too many varying factors which enter into this complex problem to allow us to be too dogmatic. Some of the factors which must be taken into consideration are: 1. The size of the community; 2. The cooperation of local organized medical profession with the health department, the school physician and private public health agencies; 3. The efficiency and financial backing of local public health organizations; 4. Public Health Nursing facilities; and 5. The type of community with which one is dealing.

Specific examples of what has been accomplished by certain communities may be of material assistance to us in formulating a diphtheria program for our own community.

The City of Detroit with a population of a million and a half has been very successful, under the Vaughan plan, in immunizing a high percentage of their children. The Vaughan plan has probably received more favorable publicity than any other now in existence. Under this plan the family physician-patient relationship is maintained to the fullest extent. The private physician is schooled in the methods of preventive medicine and in turn is remunerated by the Board of Health for inoculations they give to the indigent.

In a recent paper on Administrative Technics, Dr. Vaughan[6] states: "In the City of Detroit, all diphtheria prevention treatments are being given by the family physician and three-fourths of these are paid for by the parent. Sixty per cent. of Detroit's preschool children are now known to have received this protection."

Besides attaining its purpose in the control of diphtheria this scheme has been of inestimable value to the city of Detroit in making their physicians more public health minded not only

in matters pertaining to diphtheria but other phases of preventive medicine as well.

The City of Chicago failed in their plan of leaving diphtheria immunization in the hands of the organized medical profession so the Board of Health in 1931 took over this work. According to Bundesen, Fishbein and Niblack[7] very little if anything was accomplished in reducing the diphtheria case rate prior to 1931. The principal difficulty seemed to be in getting parents to take their children to their family doctor to have them immunized. Following this date the Chicago Board of Health assumed the full responsibility of diphtheria control. The case rate dropped from an average of 150 per 100,000 population to less than 5 per 100,000 in 1933.

Since 1933, however, the morbidity and mortality rates from diphtheria in Chicago have been steadily on the increase. An analysis of Chicago's diphtheria figures by Dr. Bundesen in October, 1935, reveals that of 674 cases occurring in 1934 and the first eight months of 1935, four hundred and sixteen of the cases, 61% occurred in children who had previously been inoculated against diphtheria. Following this experience the Chicago Board of Health has changed from its former practice of giving one dose of alum toxoid or two doses of plain toxoid and are at the present time giving plain toxoid in three doses of 1 c.c. each, one month apart.

Such an experience as this is regrettable and would be a serious handicap to any city of smaller population. In any event information such as this becomes treasured ammunition in the hands of the anti-vivisectionist and the faith healers of our country.

The City of Evanston has made an enviable record in their diphtheria control work in the past six years. Local civic, educational, and professional organizations have coordinated in making their program so successful that a period of thirty consecutive months passed without a single case of diphtheria. Dr. Pollard estimates that 50% of their inoculations are being done by the private physicians and the remainder by the Health Department.

Had it not been for a minor epidemic of twenty-four cases of diphtheria which occurred in 1934 Evanston would undoubtedly head the list of cities in Illinois having the lowest total case rate since 1930.

The City of Rockford presents an example of what may be accomplished by close cooperation between its Health Department and organized medicine. It presents a fine example of what may be accomplished through the physician-patient relationship or the immunization of individuals as against mass immunization.

In the fall of 1930 the Winnebago County Medical Society appointed a committee from its members to study the problem of diphtheria control in the City of Rockford and to formulate a program which might be applicable for this purpose.

The recommendations presented to the Medical Society, by the Committee, were gathered from similar campaigns conducted by other cities throughout the country. These recommendations which were to form the foundation for an intensive campaign in 1931 and each succeeding year since that time are familiar to everyone.

It is not my intention to burden you with minute detail regarding our policies but rather to point out salient features, both favorable and objectionable which may be of some value.

The first and most favorable feature is based upon the fact that the program was initiated, sponsored, directed and financed by the members of the County Medical Society. The City Health Department and the school physician offered their assistance and their whole hearted cooperation in every respect.

The entire responsibility for the success or failure of this venture was placed in the hands of the Medical Society. Consequently every active member did his utmost to assure its success. With the country on the threshold of socialized medicine, the medical society could not afford a failure for then social and governmental agencies would have sufficient reason for stepping in and doing the job as they thought it should be done.

Recommendations were adopted by the medical society that no inoculations were to be done by the Health Department, the Public Schools, or other clinics. All diphtheria immunizations were to be done by the family physician in his private office. Fees for inoculations were reduced to a minimum and people unable to pay a fee were immunized free of charge by the family doctor.

The second most favorable feature of our program consisted of a standard procedure of immunization. With the exception of the first

year when toxin-antitoxin was used as the immunizing agent we have adhered to the recommendation that three doses of plain toxoid be given in 1 c.c. amounts at intervals of two weeks. Woodward[8] of Rockford presented a paper before this section of the Illinois State Medical Society in 1934 in which he points out the reliability of this method of diphtheria immunization and so far it has proved dependable. To date we have not had a case of diphtheria occurring in a previously immunized child.

During the past few years most every physician has been called upon one or more times to give talks to Parent Teachers Associations, Mother Study groups, and over the radio, on the subject of diphtheria prevention. In this way it is felt that every doctor is taking an active part in the campaign. These same doctors have all gathered statistics on diphtheria morbidity and mortality and have given considerable study to the subject. As a result the active physicians of Rockford have become well informed and enthused in an important public health program.

Now instead of waiting for the annual campaign most physicians are persuading mothers to have their infants immunized between the 9th and 12th months of life. Our diphtheria prevention program is in fact taking on an aspect of a year around campaign. We still feel it is advisable though to continue a short publicity campaign each year if for no other reason than to remind ourselves, as well as the public, that to falter in our efforts will spell defeat.

There seems to be an increasing appreciation on the part of parents in Rockford that preventive medicine is a purchasable commodity and that when the family purse will permit, it should be purchased the same as any other essential of life, such as food, fuel, or shelter.

The following table statistically reflects the accomplishments of our efforts in diphtheria prevention:

| YEARS | CASES | DEATHS |
|---|---|---|
| 1929 | 93 | 5 |
| 1930 | 96 | 8 |
| CAMPAIGN STARTED | | |
| 1931 | 24 | 0 |
| 1932 | 17 | 0 |
| 1933 | 8 | 0 |
| 1934 | 5 | 1 |
| 1935 | 5 | 0 |
| 1936 | 3 | 2 |

The above figures become more impressive when compared with the number of cases of diphtheria in Rockford in the previous ten years. From 1921 to 1931 the average number of cases per year was 78 as compared with 10.3 for the past 6 years.

The main objectionable feature to Rockford's plan is the lack of reliable information that we possess relative to the number of children we may have immunized at any time. One may, with a fair degree of accuracy, determine the percentage of school children who have been inoculated without entailing too great an expense but to gather this information from our preschool child population would mean a house to house canvass. This the City of Rockford has never done and consequently we may be laboring under false impressions and wake up some time with a severe outbreak of diphtheria to deal with.

In concluding I would say that the problem of diphtheria prevention in any community is one unto itself which must be worked out carefully and diligently taking all prevailing factors into consideration but with the purpose in view of a long range program in which there is perfect harmony between all participants.

Smaller communities will do well in adhering to well established and long proven methods of active immunization and allow the larger metropolitan centers and institutions to do the pioneer investigative work with the newer immunizing agents.

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DISCUSSION

Dr. Winston H. Tucker, Springfield: I wish to congratulate both Dr. Bullock and Dr. Miller on their excellent papers. The problem of diphtheria immunization has given those of us in the State Department of Health considerable concern at times. Dr. Bullock has convinced us that physicians will cooperate wholeheartedly in diphtheria immunization programs if they are approached in the proper manner. The chief defect in both of these programs, as I see it, is the failure to get adequate records as to

the number of children who were included in the program, to be classified by age, sex and color. Any municipality that has a full-time health officer can get complete records by developing a card index and follow-up system in order to get the physicians to turn in to the health department a record of every child who is immunized. Complete records are essential to effective public health work.

Now just a word in regard to the amount and kind of material to be used when conducting diphtheria control programs. In May, 1935, Dr. Nettie Dorris, a District Health Superintendent on our staff, and I made a Schick test survey in her district of a thousand children who had received one dose of alum precipitated toxoid, and a second thousand children who had received three doses of plain toxoid, about six months previously. We found some very marked differences in the results; about 75% of the children who had received one dose of alum precipitated toxoid were Schick negative, while 95% of those who had received three doses of plain toxoid were Shick negative. These findings led the State Department of Health immediately to go on record as being in favor of injecting three doses of 1 c.c. each of plain toxoid or two doses of 1 c.c. each of alum precipitated toxoid for diphtheria immunization. It is our feeling that one dose of alum precipitated toxoid is not enough to protect children against diphtheria; they do not develop enough antitoxin. If we were to indicate a preference as to which preparation to use, we would advise three doses of plain toxoid in preference to two doses of alum precipitated. We find a three week interval between injections to be most suitable. It is the interval most commonly used in Canada and in the states in this country doing the best work in diphtheria prevention.

In regard to the follow-up Schick test, one child in ten or twenty fails to develop a negative Schick test with the recommended doses of toxoid. We suggest that a follow-up Schick test be made in every child six months after he receives the toxoid. Some of you carry out the test at three, four or five months intervals after administration of the toxoid, but we recommend six months as the standard administrative procedure. We find it to be most satisfactory. A follow-up Schick test will locate the small number of children who were not successfully immunized, and the usual injections of toxoid should be repeated. The diphtheria problem in Illinois at the present time is in children who have received toxoid at some time or other, but who never had a follow-up Schick test to determine if the procedure had been successful. They were not successfully immunized the first time, but the parents thought the children were protected. Therefore a follow-up Schick test is essential in protecting all children against diphtheria.

As you know, the Illinois Department of Health distributes plain and alum precipitated toxoid, as well as Schick test material, free of local cost to physicians in this state. With the development of a full-time health department the problem of keeping complete records may be solved here in Peoria in the near future. A well-rounded program can be developed which will make it possible to keep adequate records, not only on diphtheria immunization programs, but on all other health programs as well.

Dr. I. D. Rawlings, Chicago: I think it was in December, 1932, that the State Department of Public Health had their annual conference in Springfield and Dr. Harrison of the Public Health Service stressed that the spacing for toxoid inoculations should be at least three weeks apart. I went back to Chicago from that meeting and urged them to space their work at three weeks' intervals. They consulted Dr. Tonney and wrote to Dr. Park, of New York—and everybody in the country was following Park—and they said, no, for administrative purposes it is best to follow the spacing plan of one week apart. And against the advice of the State Health Department that plan was followed there and you heard the result. We tested out that short spacing of weekly intervals but the results did not hold up. That is one point Dr. Bullock did not bring out sufficiently, I think; that is, spacing toxoid inoculations properly. At the present time, Chicago is using injections of three doses of toxoid with a month interval between each dose. They are following practically the Toronto plan. I understand Detroit now is also using this same plan.

Dr. C. H. Benning, Peoria: I just want to make a few remarks relative to one shot of alum precipitated toxoid. I am from Michigan and have engage in this diphtheria immunization work since 1924. We used three shots of toxin-antitoxin and used four shots of toxin-antitoxin and used three shots of toxoid and two shots of toxoid, and finally in 1931 the State Department of Health recommended one shot of alum precipitated toxoid. Now, the possible antigenic value of the toxoid used in the various States, put up by the various drug concerns, might make a difference. The State of Michigan puts out its own toxoid and we feel the results we get prove that one shot of toxoid as a public health measure was ample to reduce diphtheria to almost the vanishing point. In the territory in which I was, with a population of eighty thousand people, for the last two years before I came here in 1936, we used one shot of toxoid and we did not have a single case of diphtheria in my territory. Now, that might have been luck. But, when I went there six years before we had an average of 45 to 50 cases each year and after a period of four years it was reduced down to two or three cases. I feel, where you have a large number of children to immunize, there is the advisability as a public health administrative procedure to get as many immunized as possible. One shot of toxoid may not immunize 98% but, if you immunize 80% or 85% of your children under ten years of age, you will never have any diphtheria epidemics in any community.

Dr. John J. McShane, Springfield: I do not wish to argue as to the value of alum toxoid but I think one point that Dr. Benning brought out should be clarified. Years ago when the Illinois Department

of Public Health started to distribute alum toxoid, if I am correctly informed, it contained from 4% to 9% alum, depending upon the manufacturer.

*At the present time, the alum toxoid contains only* 0.8 to 1.2% alum. The reason for the deduction in *the alum content in the toxoid was due to the fact* that where alum toxoid contained large amounts of alum, many sterile abscesses resulted and as a consequence would deter immunization programs. However, since the alum has been reduced in the toxoid and studies have been made as to its immunizing qualities, we find that one dose of alum toxoid will not immunize more than 65% of persons. As a result, the recommendation of the department is that *two doses be given three weeks apart or three doses* of the straight toxoid three weeks apart. From studies made on three doses, we find that 90% to 95% are rendered immune.

In discussing Dr. Miller's paper, I wish to state that I do not think he was quite fair to himself. He did not state that the cases of diphtheria, which resulted in fourteen deaths, were due possibly to the gravis type of diphtheria—the most virulent type of diphtheria organism known. Dr. Shaughnessy of our Department, who cultured a number of cases, found the gravis type, and unless such cases receive antitoxin early and in large doses, the mortality rate is very high.

Dr. George H. Stacy, Peoria: I will not enter into a discussion as to whether a child should have one or two shots; but the idea that I would like to contribute—and we got it yesterday when Dr. Needham presented his paper on the smallpox epidemic,—is that the procedure can be applied to the control of diphtheria as well as to that of smallpox. We all recognize that untreated diphtheria is a killer, either by strangulation or paralysis. That is common knowledge. The time for its prevention is beforehand. Once established in the child, there is at least some degree of uncertainty as to the outcome, especially when diagnosis has been delayed or frustrated. Every father and mother should be by all means told that diphtheria kills, and how, and then told that it may be prevented, and how easily. Every school child, we believe, is entitled to have a personal card to take care of the records of diphtheria and other prophylaxes, finger print identification and a personal record of diseases, accidents, injuries and operations. That personal card, we believe, should move through the grades with the pupil. An entire room can be tabulated on a single sheet, thereby giving a gross health picture of that particular room. The pupil's name, address, date of birth and place of birth, identification by preschool finger prints and later elementary school out into the world, for identification purposes, should be entered on this card; also physical examinations of the child and recommendations, diseases and disorders, such as measles, mumps, whooping-cough, smallpox, diphtheria, and the date and nature of immunizations, schools attended, the teachers' signatures.

In talking with Dr. Shaughnessy, he suggested it might be a very good idea if this were done eventually, and this record should either stay in the school or go with the pupil, after he has finished the elementary schools, and even used in after life *in industry This record would be available either* in the school or it would be among the private papers *of that particular individual. And, if it* were left in the files, a photostatic copy might be sufficient. *Such a one sheet picture of the immunization* and the health and safety record of the child, we believe, would be valuable.

Dr. Bullock (in closing): I haven't anything further to say except, as Dr. Tucker has said, in doing individual immunization as against mass immunization by the health department, the important thing *is to know how many children we have immunized* at one time, and our system has failed in that respect. I learned just a few days ago of the system that one city has employed which is working out very satisfactorily; that city makes an appropriation to pay the physician a fee of twenty-five cents for every immunization that he reports back to the health department; and, instead of making an appropriation for a house-to-house canvass to see how many children are immunized, the doctor gets twenty-five cents for each case that he turns into the health department, and it seems to work out very satisfactorily.

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## THE CONTROL OF SMALLPOX IN AN UNVACCINATED SCHOOL POPULATION

FRANK S. NEEDHAM, M. D.
Commissioner of Health
OAK PARK, ILLINOIS

The Village of Oak Park is a city-bound community of 70,000 population located in Cook County. It adjoins the City of Chicago on the north and east, Cicero and Berwyn on the south, and, on the west, the cities of Forest Park and River Forest which further join on their west the cities of Maywood, Melrose Park and Bellwood.

Late in November, 1935, smallpox was reported in Bellwood and soon spread to Melrose Park, Maywood, Forest Park and Berwyn. Realizing the close proximity of these neighboring towns, which were all less than five miles distant, every effort was made to avoid exposure from contacts. Inter-mural school athletics with these towns was prohibited during the prevalence of this disease. There were 50 cases reported in Maywood, 11 cases in Melrose Park, 3 in Forest Park and 14 in Berwyn.

A survey of our school population showed a total of about 13,000 children, of which the grade

Read before Section on Public Health & Hygiene, Illinois State Medical Society, May 18, 1937, Peoria.

schools had an enrollment of 6,752 pupils with approximately 70 per cent. unvaccinated children. The Oak Park and River Forest Township High School had, at that time, an enrollment of 3,854 pupils, 1,794 girls and 2,060 boys. Of the 1,794 girls only 142 had ever been successfully vaccinated, and of 2,060 boys only 1,071 had been vaccinated. Including the parochial and private schools we had a total unvaccinated school population of more than 65%.

During the past four years a personal letter has been sent from the Commissioner of Health to the mother of each baby born in Oak Park, within thirty days of its birth, advising the mother that her child should be protected against smallpox and diphtheria before it is one year of age.

DEPARTMENT OF HEALTH
Oak Park, Illinois

Mrs. Jane Doe,
Oak Park, Illinois.

My dear Mrs. Doe:—

The certificate of birth of your son, ———(Name)——, born ———(Date)———, at ———(Hospital)——— has been received and properly registered, No. —?—, for the year 19—, in this Department. Should it become necessary for you to have a certified copy, it may be obtained at this office at any time as these records are a part of our permanent file.

This Department feels justly proud of our hospitals and community and we believe that we have exceptional conditions for guarding the health and safety of our children. We shall continue to use our best efforts to maintain our high standards but this can only be accomplished through the cooperation of the parents and physicians.

Your little son, ———(Name)———, should be fully protected against Diphtheria and Smallpox before he is one year of age. Both of these diseases are preventable and Doctor ————, will advise you in this matter, regarding the proper time for the treatment. Duplicate certificates are enclosed which your doctor will sign and return to this Department after your child has been properly protected. The duplicate will be sealed by this Department and returned to you for future reference.

Trusting that ———(Name)——— may enjoy good health and escape the preventable diseases, I am

Very truly yours,
Frank S. Needham, M. D.,
Commissioner of Health.

For several years this Department has prepared and sent a notice to the parents and guardians which places the responsibility upon the parent or householder for reporting cases of suspected cases of contagious disease to the local Health Department. This notice is distributed through the schools to all pupils below the sixth grade and is enclosed with the September report card.

OAK PARK DEPARTMENT OF HEALTH

**To Parents and Guardians:**

**The rules and regulations of the Illinois State Department of Health, for the prevention and control of communicable diseases, provide that, when a physician is not in attendance, the *parents* or *householder* must report to the Local Department of Health all cases or suspected cases, some of which are as follows:**

| | | |
|---|---|---|
| ***Chicken Pox*** | ***Infantile Paralysis*** | ***Scarlet Fever*** |
| ***Diphtheria*** | ***Measles*** | ***Small Pox*** |
| ***German Measles*** | ***Mumps*** | ***Whooping Cough*** |

**A child who has an acute cold, cough, fever, *sore throat or rash*, should be kept at home and isolated from all other children until it is definitely known that such is not a communicable disease.**

**Diphtheria and Small Pox are preventable diseases, immunity should be produced before the child is one year old. A Schick test will determine whether your child is susceptible to diphtheria.**

**The safety and welfare of your children depends upon your cooperation.**

**FRANK S. NEEDHAM, M. D.,**
**Commissioner of Health.**

**September 1, 1936.**

No pupil who has been quarantined for a contagious disease or on account of exposure to same is re-admitted to school without an official release from the Department of Health.

Department of Health, Village of Oak Park
MUNICIPAL BUILDING
Telephone: Euclid 3
Oak Park, Ill., ..... 193...

Name of Pupil .....
Address .....
who has ben quarantined on account of .....
exposure, is now relieved from restrictions and has permission to re-enter school.

.....
Health Officer.

Form 601. 5-36. 3M.

A survey of the first grade pupils of all grade schools, during the past three years, showed about 70% unvaccinated. After this outbreak a new survey revealed only 18% unvaccinated.

Oak Park has many conscientious objectors to vaccination, others who belong to a faith that does not, as a rule, approve of medical aid, and, still others who place their confidence in irregular practitioners who have their own methods by "internal vaccination" or no vaccination at all. And we are all familiar with that organization that always comes forward with literature, etc., condemning vaccination as a source of spreading syphilis and cancer and advising people not to submit to vaccination.

Sixteen years ago an outbreak of smallpox occurred in Oak Park with about forty cases, with no deaths, and, since that time, there had been a total of 11 cases evenly distributed throughout the years.

Contact exposures occurring in Oak Park during the months of December, January and February were quarantined or promptly vaccinated

and no recognized cases developed until early in the month of March. March 9 a case of smallpox was recognized and reported. This boy attended the Fenwick High School, but, as he had not attended school since before the onset of the disease, this school was not considered exposed although an order was issued that all pupils who had not been previously vaccinated should be kept under daily observation by a physician assigned to the school. Four days later, March 13, three cases were discovered who had been in the Ascension grade school in the eruptive stage. All pupils and others employed about the Ascension School, who had not been vaccinated during the past five years, were ordered quarantined at their homes for sixteen days, until March 29. On March 13, the Oak Park and River Forest Township High School had a direct exposure from two cases who were in school in the eruptive stage. A special meeting of the Board of Health was again called and all pupils and employees of the high school were sent home at noon, March 14, 1936, with instructions to report the following morning with their certificates showing a successful vaccination against smallpox within the past five years. At the opening of school the next day 2,500 pupils were excluded and ordered quarantined at their homes for a period of sixteen days from the date of this exposure. An announcement by the Board of Health ordering the following quarantine regulations was published in the local paper:

"All teachers, pupils and employees who have been successfully vaccinated by an external vaccination within the past five years are considered immune and relieved from all restrictions. All teachers, pupils and employees who have had smallpox are also relieved of all restrictions.

"All teachers, pupils and employees who were vaccinated longer than five years ago and have been re-vaccinated since March 9th may go about their usual duties under observation.

"All teachers, pupils and employees who were not successfully vaccinated before March 9, 1936, will be quarantined at their homes until March 25, 1936."

(Signed) Dr. Frank S. Needham,
Commissioner of Health,
Village of Oak Park.

All other schools were in regular session. Extraordinary precautions were taken and examinations of all school pupils by school nurses and doctors were made daily.

All cases of reported chickenpox, of which an epidemic was prevalent at that time, were carefully re-checked by the Health Department. Also all suspicious eruptions and rashes were investigated. The confidence and co-operation of the local physicians was readily gained, and, through the Oak Park and River Forest Physicians' Club, arragements were made so that all physicians would vaccinate, without charge, any person unable to pay for vaccination. Free vaccine was distributed from the Health Department to all physicians making application for the same. A group of physicians was employed to vaccinate at the Health Department, without charge, those unable to pay for the same. Widespread publicity was given to the prevalence of smallpox in Oak Park through newspapers, talks to the Parent-Teacher Associations and local service clubs. Contact was made with all the larger stores, parent-teacher groups, business houses and dairies to insure that they had had no employees who had not been vaccinated, advising them what it would mean should smallpox develop in their place of business. As usual, much objection was made by conscientious objectors, irregular practitioners and organizations opposed to vaccination. However, the work of vaccinating progressed uninterruptedly. Over 20,000 smallpox vaccines were distributed by the Health Department and it was estimated that more than 25,000 vaccinations were made.

In less than two weeks the Department report showed that the outbreak was well under control with only seventeen cases of smallpox reported and quarantined. Release notices of quarantine were published as follows: On March 25, 1936, announcement was made by the Health Department in the local papers that "all persons who were quarantined because of small pox exposure at the Oak Park high school on March 9, 1936, who do not reside on premises now quarantined for smallpox or who do not have symptoms of this disease, are hereby relieved from quarantine restrictions and may continue their usual duties."

Later, after the opening of school, seven more cases were discovered without any further exposure to the school system. The last case, which was reported on May 1, 1936, was discovered in the ninth day of the disease.

On careful investigation it was discovered that three cases of smallpox had been reported as chickenpox. A case, discovered March 19, gave a history of a brother who was a third year high

school pupil who had left home March 11 in the pustular stage of the disease for a hitch-hiking expedition throughout the Southwest. He was heard from in Tennessee and Texas but was unable to be contacted.

This outbreak was limited to 24 cases, four of which were subsequent cases in homes already quarantined.

With the exception of one case, which was removed by this Department to the Chicago Isolation Hospital, all of the smallpox cases were quarantined at their homes. None of these cases of small pox, which were reported, investigated and verified, had ever been successfully vaccinated and no deaths occurred during this outbreak.

This outbreak was practically confined to the Oak Park high school with a total of sixteen cases.

The first case, diagnosed as chickenpox, of which the source of exposure could not be obtained, was undoubtedly the source of exposure to the three cases in the Ascension School and the one in the Fenwick high school, who were intimately associated, and, also to the exposure of the Oak Park high school.

A very careful supervision at the high school on admittance of absentees prevented four additional exposures as they were discovered before being admitted to school.

A survey of the school population six months after this outbreak showed about 85% of the pupils vaccinated.

Credit for the control of this epidemic may be given to the Village officials, High School and Grade School Boards, the physicians and the business men of the community who co-operated so wholeheartedly in this matter.

## CONCLUSIONS

1. Inasmuch as our vaccinal laws are such that compulsory vaccinations cannot be properly enforced, it is necessary that we know quite definitely the vaccination status of the school population.

2. That all cases of chickenpox, whether adult or not, should be carefully investigated.

3. That, when smallpox is prevalent, all suspicious rashes and eruptions should be investigated.

4. That all contacts should be promptly investigated, vaccinated and kept under observation for the full period of incubation, sixteen days, and that all primaries should be quarantined and kept under observation for eighteen days.

5. Whenever smallpox is prevalent in a community, prompt publicity should be given to the same.

6. Confidence and the fullest co-operation of the medical profession must be gained at the onset to avoid friction and to obtain the support of local physicians which is necessary to cope with the situation.

7. The respect, confidence and co-operation of parents must be maintained at all times but more especially emphasized during an epidemic of any type.

## DISCUSSION

Isaac D. Rawlings, M. D., Chief Bureau of Communicable Diseases, Chicago Board of Health: We must congratulate Dr. Needham on the prompt, aggressive and efficient handling of a difficult, threatening and potentially dangerous situation. An outbreak of smallpox in any school or other unit of a population which is less than 50% protected by vaccination against smallpox may prove serious. That Dr. Needham was successful in speedily stamping out this outbreak in so short a period is conclusive evidence that he used approved and efficient methods.

The especial thanks of the speaker is due Dr. Needham for the spendid cooperation given the Chicago Board of Health by permitting a representative of the Communicable Disease Bureau to obtain a list of each person living or working in Chicago who had been exposed to any Oak Park case of smallpox. These exposures in Chicago were vaccinated and quarantined and visited every other day to make sure no unknown outbreak occurred in Chicago. No one could have done a better job than Dr. Needham did under existing conditions. We must agree also with Dr. Needham's conclusions.

The point in the paper which I wish particularly to discuss is the inference that because of the absence of a compulsory vaccination law, the health officer in spite of his best efforts in contacting and urging parents to get their children vaccinated, and even with the full cooperation of the local medical practitioners is powerless to keep the school and other units of the population reasonably protected against smallpox by vaccination. This plan of putting the responsibility for vaccination squarely on the parents, with repeated urging that they get their children protected, is the usual and popular method in many health jurisdictions in Illinois. A local epidemic of smallpox occurs and under the scare and pressure during the outbreak about 60 to 70% of the school population become protected and the epidemic soon ends. Then, in the absence of smallpox over a period of years, vaccination is neglected by parents in spite of the urging of the local health officer. After a period of 8 to 16 years the well vaccinated population has changed to a population in

which the preschool and school population is only 15 to 30% vaccinated. Then along comes another outbreak and the population again becomes 70 to 85% vaccinated. That is what occurred in Oak Park and is occurring each year at points in Illinois and in many other states.

Chicago formerly handled smallpox and vaccination campaigns in that way. An epidemic in 1864 was followed by few smallpox cases and much neglect of vaccination. Then another epidemic occurred in 1872-1873, followed against by few smallpox cases with resulting neglect of vaccination, and still another extensive epidemic took place in 1881-1882. Again few cases resulted, with neglect once more of vaccination. Then came the epidemic in 1894 and 1895, following Chicago's World's Fair, with over 2300 reported cases of smallpox and over 1000 deaths during 1894. To stop that epidemic it was necessary to do wholesale vaccinations. In one month over half a million free vaccinations were made and during the year 1894, over a million free vaccinations were performed at an enormous financial outlay in a population of 1,600,000. That horrible experience taught Chicago that it was far beter to prevent smallpox systematically by yearly vaccinations than to have to fight extensive periodical outbreaks.

Since 1894 and 1895, Chicago has never had a smallpox outbreak approximating in any year one-half as many cases in proportion to its population as Dr. Needham has described. Our plan to keep our population fairly well vaccinated is to perform an average of more vaccinations against smallpox each year than we have births for that year.

The following table illustrates this plan:

| Year | Total births | Total B. of H. vacinations | Total vaccine tubes distributed | Total smallpox cases |
|---|---|---|---|---|
| 1932 | 49,258 | 90,189 | 100,245 | 11 |
| 1933 | 46,655 | 117,049 | 177,690 | 8 |
| 1934 | 47,955 | 52,038 | 118,500 | 0 |
| 1935 | 49,425 | 46,793 | 100,500 | 1 |
| 1936 | 47,939 | 68.788 | 143,650 | 12 |
| Total | 241,232 | 374,857 | 640,585 | 32 |
| 5 year average | 48,246 | 74,971 | 128,117 | 6.4 |

These figures show that for this five year period there is an average of 26,725 more vaccinations each year than there are recorded births. Note also that the vaccine tubes distributed averaged each year 53,145 more than the yearly average vaccinations performed by the Board of Health. The 53,145 vaccine tubes distributed annually in excess of those used by the Board of Health represent the vaccine distributed to physicians and presumably represents the approximate number of vaccinations done by private physicians yearly in excess of those performed by the Board of Health.

Smallpox cases recorded in Chicago in 1936 totaled 12 with no deaths. When we remember Dr. Needham's statement that smallpox was epidemic not only in Oak Park but also in several other Cook County communities on our west and that most of the 12 cases were traceable to direct or indirect contact with known cases, originating outside of Chicago, it is a fine tribute to the efficiency of the Bureau that this disease was kept from reaching epidemic proportions in Chicago.

With smallpox threatening in the metropolitan area of Chicago on our west, the Bureau undertook extensive precautionary vaccination. This included distribution of request cards to all pupils in the schools along the western border, that is, between west 33rd street and Belmont avenue, urging each to go to his family physician. If the family signed the request for the Board of Health to do this vaccination, it was done by the school health officer. Each manager of the 30 factories and industries in this area was visited and told of the smallpox cases on the west and urged, for the protection of the business, to have all employes vaccinated by their family physician or the firm's doctor; and a recheck was made ten days later by the Board of Health to see what was done. If nothing was done, the Board of Health offered to do these vaccinations. Others approached included the transportation lines, the management of theaters, all chain-stores, State street stores, and other firms with branches located in this area. Not one Chicago case of smallpox had its source traced to Oak Park, thanks to the splendid cooperation given us by Dr. Needham. However, two and posibly three cases were traced to Maywood and one to Melrose Park.

In conclusion we may say that Chicago, through having its schools and other units of population well vaccinated, plus the special vaccinations in the area threatened, and the vaccination and close control of known exposures, was able to prevent the development of a single case of smallpox from the Oak Park outbreak. Had Chicago had as many cases of smallpox as Oak Park in proportion to its population, in 1936 there would have been 1,200 instead of 12 cases of smallpox.

## THE TREATMENT OF NONCONVULSIVE TOXEMIA OF PREGNANCY AT THE CHICAGO LYING-IN HOSPITAL

WILLIAM J. DIECKMANN, B. S., M. D.

CHICAGO

The term "toxemia of pregnancy" always suggests the patient with high blood pressure, albuminuria, edema and especially the occurrence of convulsions. Statistics collected from hospitals in various parts of the U. S. indicate that the incidence of eclampsia is 0.583% with a mortality of 13.06% and of nonconvulsive toxemia is 4.39% with a mortality of 1.68%. During the past five years 13,735 patients have

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been delivered in the hospital. There were 50 patients (0.36%) who had convulsions and over 1000 (7.28%) who had toxemia but no convulsions or coma. There were many more in whom the symptoms either subsided before admission to the hospital or were of so mild a nature that they escaped diagnosis by the staff. From these figures it is obvious that the number of patients who do not have eclampsia far outnumbers those who do. Because of this fact I shall describe the method of treatment used in the toxemia clinic of the hospital for the ambulatory type of patient and also that used when the patient's condition requires hospitalization.

Within the past few years various statements have been made relative to the value of prenatal care. One was that prenatal care is of no value. We are just reviewing all of our toxemia cases and it is obvious that prenatal care is of value if the physician properly interprets the various symptoms and signs. Another statement which has been made is that proper care at the time of delivery is of more value than prenatal care. This is only partly true because, although proper obstetric care at delivery will in almost all instances save the patient's life and quite often that of the baby, irremediable injury may have occurred to the mother with the resultant decrease in her life expectancy.

*Edema.* This is the most frequent finding in pregnancy and quite often it is difficult to decide if the edema is that of normal pregnancy or if it is caused by a beginning toxemia. We have found that periodic weights are of far more importance than watching for pitting edema of the ankles. We watch not only the total weight gain but pay particular attention to the rapidity of gain. In normal pregnancy the average gain should be 21 pounds. Any gain over this figure should be regarded with suspicion because it may be due to retention of water. We regard a gain of more than 1.5 pounds per week as definite evidence of retention of water. It is our belief that true pregnancy toxemia or pre-eclampsia usually begins first with this invisible retention of water which as a rule eventually becomes recognizable as pitting edema of the extremities.

*Hypertension.* Many patients show evidence of hypertension when first seen. This is usually due to excitement. The first trimester of pregnancy is characterized by a decrease in blood pressure, but at term there has usually been a 15 to 20 mm. increase in systolic pressure. We regard a systolic of 130 to 139 with suspicion, and diagnose it as abnormal if it is 140 or more on two or more occasions. We no longer use the term chronic nephritis for this group of patients who have primarily hypertension in pregnancy. We believe that the majority of patients with hypertension have an essential or primary hypertension. In many instances pregnancy has stimulated an increase in blood pressure where there was a predisposition to it, rather than been the actual cause of the hypertension. This has been particularly demonstrated by the ice water test in which a number of patients were tested early in pregnancy and two-thirds of those who gave an abnormal response with a normal blood pressure at that time subsequently showed evidence of toxemia.

*Proteinuria.* The occurrence of protein in the urine has always been regarded with suspicion in pregnancy. There is a minimal amount of protein excreted by the normal individual. When the proteinuria can be detected with the heat and acetic acid or sulphosalicylic acid, it is abnormal in amount. It has been our experience that if the patient has a persistent proteinuria she should have a thorough examination of urine and blood to determine its cause, but as long as the total amount of protein for 24 hours is less than 3 Gm. one need not be concerned about its effect on the pregnancy.

*Symptoms.* The onset of the various cerebral, visual, gastro-intestinal, and renal symptoms in the patient who has shown excessive gain in weight or edema should always be regarded with gravity because they usually are the precursors of convulsions.

*Treatment. — Ambulatory patients.* They should be seen every two weeks before the 30th week of pregnancy and every week after that. The fetal mortality at viability, or 28 weeks, is so high that we attempt to carry the patient to at least 32 weeks and preferably 34 to 36 before terminating the pregnancy. In a subsequent paragraph we outline criteria which would warrant therapeutic abortion in the first half of pregnancy. However, if the symptoms are not sufficiently severe, we advise the patient to take a general diet which should include at least an egg daily, one quart of milk, a serving of meat

or cheese, bread, vegetables and fruits. No salt is to be used in cooking or at the table and all foods containing large amounts of salt, such as crackers, ham, salt fish, pretzels, beer, and so forth are prohibited. The average excretion of sodium chloride on a general diet is 10 to 15 Gm. per day. The ingestion of sodium chloride must be restricted until the excretion amounts to less than 3 Gm. before any amelioration of symptoms and signs will occur. In addition, we advise one or two hours bed rest in the morning and afternoon and ten hours sleep at night. Excessive walking, exercises, house cleaning, washing, etc. are prohibited. If in spite of this regime the patient continues to gain weight, we prohibit the use of fats, thus the patient is told to eat no pie, cake or fatty food of any kind and the intake of bread is limited.

If no improvement occurs within a period of one week, the patient is placed on a diet of fruits, vegetables, eggs, cereal, toast, tea and coffee. All of these diets are, of course, salt poor. This is not a maintenance diet and should not be used for a period greater than three weeks.

The next regime is one in which the patient is advised to stay in bed and to eat only fruits and fruit juices. This should not be continued longer than 7 to 10 days. When this period has been reached the patient is usually given one-half grain of phenobarbital two or three times daily. We have not been able to reduce edema by the use of mercurial diuretics or ammonium nitrate or chloride. We are at present trying potassium nitrate.

*Danger Signals. Pre-eclampsia.* This group comprises about half of the toxemias of pregnancy. The patient should be hospitalized if any of the following symptoms or signs develop:

- a sudden increase in the weight of 3 pounds or more per week
- a sudden rise of the systolic blood pressure of 30 mm. or more
- an increase of the proteinuria to 0.5% or more
- a +++ test for albumin in the 24 hour volume of urine
- the sudden appearance of edema in a patient who has been gaining excessively
- the onset of the various cerebral, visual or gastrointestinal symptoms

*Vascular-Renal.* This group comprises approximately half of the so-called toxemias of pregnancy and this term is suggested as more suitable than chronic nephritis because, although some of these patients have renal impairment due to nephro-sclerosis, the hypertension is the primary disease. These patients may have convulsions which may be eclamptic in origin or may be due to cerebral changes caused by the vascular disease. In general, the patient who shows primarily a hypertension rarely has convulsions. What we fear in these patients is fetal death, due either to the separation or to the marked infarction of the placenta. If the blood pressure does not increase in these patients they may be carried to term. We have a very small group of patients with a definite hypertension in whom the pressure either did not increase or, what is more important, actually decreased during pregnancy. This is not the usual course. A sudden increase in the systolic blood pressure of 30 or more points, or the appearance of, or increase in, proteinuria to more than 5 Gm. per day, warrants hospitalization. In many of these cases with a systolic blood pressure of 180 or more we are satisfied if we can carry the pregnancy to 34 or 36 weeks and at that time terminate it. The babies are usually small, but if we let them go to term, there will be a high percentage of intrauterine death of the fetus. These patients have an incurable disease and will not have many children. If premature delivery through the natural passage seems dangerous for the baby because of an uneffaced and closed cervix, cesarean section is seriously considered, although it is surprising how short the labors may be even though the cervix was closed at the beginning. The use of a bag is the preferable method of inducing labor in these patients.

*Treatment.—Hospital patients.* The treatment is essentially that used in the clinic, but proper composition of the diet, rest and elimination can be carried out under controlled conditions.

The criteria used for determining the management of the pregnancy after hospitalization are as follows:

### SYMPTOMS AND SIGNS OF SEVERE TOXEMIA OF PREGNANCY

Group A

1. Edema of legs, hands, face, and/or vulva. Excessive or too rapid gain in weight.
2. Albuminuria amounts to more than 10 Gm. per day or the concentration is greater than 0.5 per cent.
3. Blood pressure is consistently over 160 systolic.

Group B

4. Cerebral, visual and gastrointestinal symptoms and signs.
5. Hematuria.
6. Oliguria or anuria.
7. Jaundice.
8. Tachycardia of 120 or more per minute.
9. Cardiovascular impairment (edema of the lungs, cyanosis, etc.).
10. Blood N.P.N. which is more than 50 mg. per cent.
11. Blood concentration as indicated by abnormally high or increasing hemoglobin, cell volume or serum protein concentration.

PREGNANCY

Before 24 weeks. Terminate if more than one of the above listed criteria are present or if there is no appreciable improvement after 7 days of adequate treatment.

25-31 weeks. No interference before 32 weeks' gestation unless some of Group "B" signs develop or those in "A" persist despite treatment or increase in degree.

32-36 weeks. Terminate if 2 of Group "A" signs develop or increase in severity, otherwise no interference unless Group "B" signs appear.

37-40 weeks. If Group "B" signs are absent, medical treatment until the cervix is soft and effaced and a mechanical induction of labor will be successful. If Group "A" signs increase in degree or if any of "B" appear, the pregnanacy should be terminated either by:

1. Rupture of membranes and/or insertion of a bag, or
2. Cesarean section if the cervix is uneffaced and firm. The environment must be suitable and local anesthesia should be used.

These are the rules which we attempt to follow in treating pregnant patients with toxemia, but it must be emphasized that each patient must be regarded as an individual problem.

CONCLUSIONS

Intelligent prenatal care will prevent the occurrence of eclampsia. Those cases which occur despite its use are usually of the mild type.

The incidence of non-convulsive toxemia of pregnancy has not been materially decreased by prenatal care but many cases have undoubtedly been prevented from becoming serious. Furthermore, early diagnosis and recognition of the underlying pathology have often resulted in therapeutic abortion or premature termination of pregnancy. The object in both instances has been to increase the life expectancy of the mother and in the latter to offer the fetus its best chance of survival.

Dietary fads, supposedly specific medication and hormones have all failed to cause improvement in our patients with toxemia.

DISCUSSION

Dr. William A. Michael, Peoria: Dr. Dieckmann has dealt with the treatment of non-convulsive toxemias in a very sane and forceful fashion. I feel, too, that a more general application of the methods he advocates will certainly lower the incidence of the eclamptic seizure and also lower the maternal mortality.

While the etiology of the toxemias of pregnancy remains obscure, physicochemical investigations that have been carried out in the last few years have certainly yielded valuable information as a basis for treatment of these abnormal conditions. I feel it is through this avenue that eventually will come the true etiology of the toxemias.

I am inclined to disagree a bit with the speaker regarding the ophthalmoscopic examination. I feel that very valuable information can be gained from repeated ophthalmoscopic examination both from the standpoint of diagnosis and prognosis.

If you will pardon a personal allusion, it has been a pleasure to me to follow the work of Dr. Dieckmann in this field in the past several years, inasmuch as he was an intern on the service during my residency. It has been a pleasure indeed to hear his presentation.

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## PROGNOSIS IN CARDIAC DISEASE

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To often, in our endeavors to correctly diagnose the status of the cardiac patient and to institute the proper treatment, we forget the interest which the patient has in the prognosis. To him, it is a matter of importance that he should be relieved of pain or sleeplessness or dyspnea; it is important that he should be treated for cardiac disease if he has it, but to many patients it is even more important to know what the future has in store for him. Is he hopelessly sick and permanently incapacitated? Must he alter his whole manner of living? Depending upon the patient's conception of his disease, the questions

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as to the outlook include all manner of possibilities. Is his condition hopeless? What help, temporary or permanent, may he expect? To what extent, in his particular case, is he incapacitated for work, particularly for the work in which he is already engaged as the source of his livelihood. These questions, and many more, are familiar to every physician. To the patient, his or her relatives and dependents, such questions are vital. Upon the answer the family must base plans for the future, plans for the patient, plans for dependents, and for business associates; arrangements must often be made for carrying on or discontinuing a business.

Oftentimes in the early stages of cardiac disease, prior to any signs of failure, individuals are met whose symptoms are the result only of the knowledge of the presence of a cardiac lesion. Such knowledge often is sufficient to create a state of apprehension so great as to actually cause some degree of physical disability. Patients in this group, even though they are in no immediate danger of incapacity (indeed, are often likely to continue fit for work for years), may be decidedly refractory to the encouragement which is the only truthful answer to their queries; the fear engendered by the term, "cardiac disease," outweighs every other consideration. Between the patients with well-defined cardiac disease and those with purely neurotic findings and symptoms, is a border-line group, which includes widely different clinical pictures: herein, for instance, we find the patient with ectopic beats unassociated with any other evidence of disease, usually a harmless irregularity; then the patient with tachycardia which is due to some non-cardiac disease such as thyrotoxicosis; in the group of cardiac diseases of doubtful origin and significance, we must include those patients, usually men, in the late thirties or the forties, who complain of cardiac pain, often mildly characteristic in type, with or without cardiac irregularities; there may be an associated rise of blood pressure of moderate degree and questionable significance.

In the attempt to present underlying principles of prognosis we encounter many difficulties. The relationships of age, sex, color, occupation and coincident disease, the underlying etiological factor, the stage of the disease, the occasional coincidence of more than one type of cardiac disease, and the frequent association with renal, vascular or pulmonary disease, make precise or accurate statements impossible. Nevertheless, in the hope of shedding some light upon an obscure and difficult subject, such an attempt will be made.

The occurrence of valvular disease in the course of acute rheumatic fever, or its congeners, scarlatina and chorea, usually means a permanent lesion, although in recent years certain studies have been published which indicate that in a fairly large number of cases the signs of valvular disease ultimately disappear. While such evidence of entire recovery may be ocasionally determined, this is an event which cannot be expected, and should be included in the prognosis with definite reservations. The valvular lesion of a first attack of any of the rheumatic group of diseases may subside with the disappearance of the physical signs; the lesion may persist, which is the usual result, for the rest of the patient's life. The mere presence of multiple valvular lesions does not notably alter the prognosis.

If the original lesion is not reactivated by fresh infections the outlook for life and activity is good. A fairly large number of patients are seen in late middle age with the physical signs of rheumatic heart disease dating back to childhood, yet these people have gone through years of normal living, often doing strenuous work.

Rheumatic cardiac disease as the cause of death and disability is usually found in association with hearts that have sustained repeated attacks of infection. In the presence of a valvular lesion the prognosis is clouded by recurrent attacks of fever following minor respiratory infections, by repeated attacks of rheumatic fever, often of minor severity, and by prevalent infections, particularly tonsillitis and the group loosely classified as influenza. Partly because of more extensive disease, partly because of repeated involvement of the muscle, compensation fails. This group includes the patients who go on through weary years of alternation of fair health and cardiac breakdown, until the final break comes. Subacute bacterial endocarditis is always secondary to previous valvular disease; it is superimposed, not primary. In my experience, the appearance of signs of embolism, in association with fever, splenic enlargement and a positive culture of the streptococcus viridans has always been followed by a fatal outcome.

Simple syphilitic aortitis with minor symp-

toms responsible for some disability, may occur in the secondary stage: my experience includes very few cases which warranted such a diagnosis. Syphilis of the cardiovascular system as a cause of disability and death is practically confined to three types of disease: (a) aortic regurgitation with congestive failure; (b) aneurism of the aorta, usually of the thoracic portion; (c) narrowing of the orifices of the coronary vessels. In the first group, the onset of cardiac failure is fraught with a grave prognosis; restoration of compensation may be attained, but exacerbations are easily provoked, and once decompensation has occurred the prognosis is usually unfavorable. In the past ten years, the use of antisyphilitic treatment, mercury, arsenicals and bismuth, as well as potassium iodide, has improved the outlook materially. The first three drugs mentioned must be used with care, in doses much smaller than are given in secondary syphilis, and such medication should not be started in the presence of gross decompensation; a fair degree of compensation must first be obtained. In the past five years, the literature has contained several exhaustive articles on this subject to which those who are interested may be referred. Among individuals with inadequate or untreated syphilis aortic regurgitation will appear in about 40% within an average time of about twenty years after infection. Within the same average period about 25% will die of the cardiac involvement. The negro is especially susceptible to the cardiovascular complications of syphilis.

The duration of symptoms of aneurism is surprisingly variable. Patients have been seen with fairly large aneurisms without great disability. The prognosis is poor if the aneurism is complicated by aortic regurgitation. Otherwise the patient may live for some years, although the possibility of rupture with sudden death must always be borne in mind. The average age at death from syphilitic aortic regurgitation and aneurism is about the same, about 45; the average time after the initial infection at which death occurs is about 20 to 25 years. A very large proportion of such cases never had adequate treatment, which is of notable value in the prevention of cardiac complications if instituted early in the course of the initial infection.

Syphilitic aortitis associated with symptoms of anginal character presents peculiar features as to treatment and prognosis. Pain of anginal character of the type attributed to coronary disease, occurring in the course of syphilitic aortitis may be due to the ordinary type of coronary arteriosclerosis, to aneurism, occasionally to aortic regurgitation or to narrowing of the coronary orifices resulting from the syphilitic process itself, or a combination of multiple causes. Syphilis does not invade the coronary arteries: the puckering of the aortic intima may be responsible for stenosis of the coronary orifices. This stenosis may be associated with attacks of angina pectoris, possibly with paroxysmal dyspnea, though this is uncommon in the absence of hypertension. Such attacks may terminate in sudden death. The incidence of sudden death, in the course of syphilitic aortitis, due to coronary disease or ruptured aneurism, is probably greater in private practice than in hospital practice. According to Martland, "Syphilitic heart disease (33%) is next in importance (as a cause of sudden death) to arteriosclerotic heart disease (47%) which is responsible for the greatest number of cardiac deaths."

Hypertensive heart disease is associated with three types of cardiac manifestations, all of which present certain features of significance: 1. cardiac hypertrophy; 2. anginal failure, and 3. congestive failure. The first two will be discussed under the headings mentioned. Here attention is directed to hypertensive heart disease with congestive failure. The first prognostic criterion is the response to rest and digitalis; if compensation promptly ensues, the outlook for the patient is good, provided he will submit to the necessary restrictions, which include curtailment of physical activities and avoidance of emotional and nervous strain. The directions to these patients must include dietary restrictions, partly for the purpose of preventing overweight and partly to protect the heart from various symptoms which may follow overeating. Under a proper regime, with due regard to the individual situation, a good prognosis is justifiable, but this is dependent upon the promptitude and completeness of the return to compensation, the cooperation of the patient, and to an extent which cannot be defined, upon the height of the blood pressure. Here, as in most cases of cardiac disease, the prognosis is largely dependent upon the situation in life, the oportunities for

lessened activity, for freedom from worry and care.

The arteriosclerotic heart cannot be wholly separated from the hypertensive group—the two overlap. In general, the patients with arteriosclerotic cardiac disease are of more advanced years than those in the other groups. The mechanism of adjustment to abnormal situations is inadequate as compared with that of younger people; the arterioscleratic process is likely to be general; the essential disease is vascular and widespread. Upon the whole, this group responds poorly to the usual methods of treatment and relapse is early.

The relationship of cardiac hypertrophy in itself to prognosis is a matter of more importance from the standpoint of insurance than from that of general practice. Cardiac hypertrophy is a result in the course of most cardiac diseases. It may be present through many years. That it is a matter of some moment may be inferred from the importance attached to this deviation from the normal by insurance companies. Hypertrophy is a stage on the way to the ultimate breakdown, but in the individual case the prognosis depends upon the presence or absence of other type of cardiac failure, the question as to whether or not the primary cause is stationary or progressive (in old rheumatic disease after a long period without recurrence of active infection, the former may be present, in hypertension with a steadily rising systolic pressure, the latter) and the state of the coronary vessels. For instance, a fairly large proportion of patients with aortic stenosis of rheumatic origin will develop marked hypertrophy, yet live to relatively old age.

Anginal failure includes two important groups of disease—angina pectoris and coronary occlusion. Few of us are willing to express dogmatic opinions as to the duration of life in these groups. Every prognosis must be qualified by our knowledge of the possibility of sudden death, though this aspect should not be discussed with the patient. Nothing will destroy the morale of a patient so completely as to give him the impression that sudden death is the probable outcome of his disease. As a matter of fact, it is not; suddent death is not frequent. It is, however, an aspect of the disease which requires appraisal to some member of the family, but not to the patient. After this hazard has been given consideration, certain other important facts require attention.

Angina pectoris, as an essential disease, offers a prognosis based upon the frequency and severity of the attacks, (which may be so pronounced as to incapacitate the patient and yet persist for years, though this is infrequent) the response to rest, the capacity of the patient to rid himself of anxiety, the willingness of the patient to avoid nervous, mental and physical overstrain, including exposure and overeating. Coronary occlusion presents a mortality rate of about 20% in the first attack. The prognosis in the acute attack is bad in cases characterized by cyanosis, marked tachycardia, pulmonary congestion, significant fall of the blood pressure, or the development of edema. It has been my experience that the development of congestive failure following a coronary occlusion is a particularly ominous symptom. The patient whose symptoms disappear, whose electrocardiogram becomes practically normal, who is able to protect himself from physical and mental strain, has a good outlook for life. Subsequent occlusions may occur and are found in a fairly large percentage of cases. The prognosis is distinctly worse in the recurrent occlusions. The electrocardiogram is of great value in diagnosis; the prognosis may be gauged more accurately by reliance upon the clinical aspects. The prognosis is further dependent upon the patient's attitude and his willingness to accept restrictions. The nervous, apprehensive patient is always a source of anxiety to his physician. The cooperative patient, willing to accept a prolonged period of rest, restrictions of diet, exercise and recreation, is usually rewarded by the return to a considerable degree of good health. In some patients, but in my experience only in a small minority, the major attack is followed by attacks of angina pectoris. The prognosis for this group is not good: the return to health is far from complete, and subsequent attacks of occlusion are relatively frequent.

The emphysema heart is characterized by the symptoms and physical findings of right ventricular failure in patients who have long had the signs of emphysema. The prognosis is poor. The failure is practically always of the congestive type. In my own experience the onset has

almost invariably been followed by one exacerbation of congestive failure after another: improvement may occur after proper treatment but with moderate increase of activity the symptoms of failure recur: this alternation of improvement and exacerbation keeps the patient incapacitated through the short space of life left to him.

*Acute pericarditis is a serious complication of* rheumatic fever, scarlatina or chorea, occasionally of pneumonia, especially of the type known as influenzal bronchopneumonia. Prognosis must be guarded. Chronic pericarditis of the adhesive type is recognized as an occasional cause of persistent, progressive and finally fatal, cardiac failure. *Surgery offers some hope in these cases.*

A question of never-failing interest is that of the various cardiac irregularities, irrespective of the underlying lesion. What is the prognostic significance of these forms of aberrant cardiac activity? The premature contraction, spoken of as the extrasystole, is usually of little consequence. It causes the patient much more concern than is warranted. It is not, in itself, an indication of cardiac disease, and may be disregarded except for the annoyance to the patient; it is significant only upon certain conditions. In chronic cardiac disease ectopic beats may be related to myocardial fibrosis or ventricular strain; the appearance of such beats is of little or no clinical significance. In the course of acute infections, such as pneumonia, irregularities are usually of serious import, but not necessarily ominous. These arrhythmias call for careful discrimination in treatment; they may be aggravated by stimulants. Because of the frequent use of digitalis in pneumonia it should be emphasized that this drug may produce ectopic beats; the appearance of such an irregularity under the administration of digitalis is an indication for the prompt withdrawal of the drug.

The occurrence of ectopic beats has some prognostic value in cases of coronary occlusion, in which cardiac irregularities of any type, developing shortly after a fresh attack, may be significant. Now and then, following the onset of ectopic ventricular beats, the patient develops paroxysmal tachycardia or dies suddenly, probably as the result of a ventricular fibrillation. Numerous ectopic beats occurring shortly after an occlusion, call for particular effort to provide rest and quiet for the patient. Quinidin is often useful here, while digitalis is dangerous under these conditions. In cases of congestive failure under treatment with digitalis, the appearance of ectopic ventricular beats calls for the discontinuance of the drug. Failure to stop the digitalis may precipitate serious forms of digitalis intoxication.

*The various tachycardias*—simple paroxysmal tachycardia, auricular fibrillation or flutter usually offer a good prognosis, although ventricular tachycardia is usually an event in the course of serious myocardial disease.

An established fibrillation, such as is found so often in certain types of disease, especially the rheumatic, arteriosclerotic and thyrotoxic, does not greatly alter the prognosis. The appearance of this rhythm may be accepted as another mark of progressive cardiac damage; but many patients, especially of the arteriosclerotic group, will survive the onset of fibrillation for years. Fibrillation of thyrotoxic origin is often supplanted by the normal mechanism after a successful thyroidectomy.

*Heart block is not incompatible with many* years of life. A large proportion of the few patients who are found with this rhythm is made up of older people and the block is associated with marked myocardial change, usually upon an arteriosclerotic basis. This probably accounts for the relatively short duration of life after the dissociation is discovered. Frequently, the appearance of the Stokes-Adams syndrome is of bad prognostic significance, though even here, life is often prolonged through years, rather than months. Reports may be found in the literature of numerous cases in which complete auriculoventricular block has existed for years following diphtheria without notably incapacitating the patient.

The electrocardiogram, valuable as it is in diagnosis, is to be applied to prognosis only with due consideration of the clinical features of any given case. Serial electrocardiograms may be significantly helpful.

In conclusion, may we emphasize the importance of careful prognosis. To the patient this feature of our work is decidedly important; the same statement applies to the family and to business associates. It should be our endeavor to properly consider this aspect of cardiac disease. Upon our decision the usefulness of many lives

depends. The good judgment of the physician may keep alive the patient's interests in his work and his future, and relieve the patient and the family of the depression which comes with the feeling that a fatal disease impends. On the other hand, a correct prognosis may be the basis upon which the affairs of the patient may be best adjusted, if the outlook is unfavorable. From either aspect, it is worth the while of the physician to apply his knowledge and experience to a question of such vital importance, both to the patient and to those deeply interested in his welfare. When such is possible, and truthful, the good prognosis is a medicine hardly to be excelled.

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## THE HEALTH HAZARD IN THE USE OF CARBON TETRACHLORIDE

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Carbon tetrachloride or tetrachlormethane, $C Cl_4$, is a heavy, volatile, non-inflammable liquid having an odor similar to chloroform. It is an excellent solvent for fats and many resins and cellulose compounds. Being the cheapest flame proof fat solvent obtainable, it has found increasing industrial use.

It is often added to naphtha to reduce fire hazard, too often without properly appreciating the added health hazard. In the rubber industry especially[1] it has been substituted for benzol, which is equally toxic and inflammable, and carbon disulphide, much more toxic and highly inflammable. Substitutions of this sort are often desirable but it should always be kept in mind that one may be introducing a different hazard and one less well understood. Carbon tetrachloride and similar compounds are sometimes used in paints and lacquers.[2]

At present, the principle uses are in degreasing dry cleaning, paints and related preparations, fat extraction, rubber solvent, fire extinguishers and in the treatment of hookworm disease. Workers likely to be exposed include dry cleaners, rubber workers, firemen, lacquerers, degreasers, vulcanizers, painters, janitors and machinists.

Most of the literature deals with acute poisoning. Chronic effects may be more important from the health standpoint but are less easy to diagnose and, therefore, are less known. Carbon tetrachloride and similar substances are not stored in the body and, hence, are not cumulative poisons in the way that heavy metals are. However, the effects of cellular destruction are cumulative.

Acute carbon tetrachloride poisoning is characterized by abdominal pains, vomiting, diarrhea, jaundice, anemia, pulmonary inflammation and edema, and urinary suppression with urine high in albumin, casts and bile pigments.[3,4] First symptoms of chronic poisoning are persistent headaches, nausea, loss of appetite, loss of weight and irritation of the eyes, nose and throat.[3]

There are individual differences in susceptibility but it is desirable and feasible to reduce the atmospheric contaminations to amounts which are safe for all. Obese or undernourished individuals and those with kidney, liver, lung or thyroid disease or addicted to the use of alcohol are especially susceptible.[3] Diets high in carbohydrates and calcium and relatively low in protein and fat tend to decrease susceptibility and aid in the treatment.

Often the relative toxicity of compounds of this nature is measured by their narcotic action. Carbon tetrachloride has a narcotic effect of about half that of chloroform, but its actual toxic effect, while similar, is much more severe for the same amount of exposure. Carbon tetrachloride is the most toxic of the chlorinated methanes. Tetrachlorethane is more toxic and the chlorinated naphthaleins and diphenyls (waxes) still more so.

Trichlorethylene is being used rather extensively for removing grease and waxes from small articles by dipping. Manufacturers often consider it harmless. However, it has effects similar to carbon tetrachloride, possibly less pronounced, and the vapors are known to cause an atrophy of the optic nerve and the sensory fibres of the fifth cranial nerve.[4]

Tentatively, amounts in excess of 100 parts per million of carbon tetrachloride vapor in the air are deemed harmful by this department. The smallest amount detectable by smell for the average individual when first entering the atmosphere is probably about 100 parts per million.[5] In view of this, even a slight odor is indicative of a health hazard. Chemical means have recently been developed for determining low concentrations quite accurately.

It has been reported that a resistance may be developed by continued exposure.[5] However, this applies chiefly to very low concentrations and may readily be explained by greater care, diet, etc. Based on our present knowledge, it would be extremely hazardous to assume that workers accustomed to very small amounts of vapor could withstand relatively high concentrations. Recovery from mild and sometimes severe cases of acute poisoning appears to be complete, but there is no doubt a permanent kidney and liver damage. This may predispose the individual to disease later. Occasionally a mild addiction may be acquired for this and similiar compounds, and chronic poisoning has been traced to this fact.[3]

When strongly heated, especially in the presence of water vapor or alcohol, carbon tetrachloride forms chlorine, hydrogen chloride and phosgene, all of which are highly toxic. This occurs in the presence of open flames.[6] Carbon tetrachloride should not be used in extinguishing fires in closed places or where there is a great amount of heat. It has been suggested that the toxic action may be due to these same decomposition products produced in the body cells.[3] Commercial carbon tetrachloride sometimes contains phosgene and chlorene as impurities. This would greatly increase the hazard.

Carbon tetrachloride, in common with all fat solvents, is responsible for certain dermatoses. It is thought that the chlorine has a special irritating effect.[7] This is a minor hazard as compared to the effects of inhaling the vapors, but it is possible that absorption through the skin may cause poisoning.

Control of poisonous volatile liquids in industry consists in handling them in a completely closed system where this is feasible. Where this is not feasible, local ventilation by mechanical means is necessary, except where very small amounts are used only occasionally. This is frequently accomplished by performing the operation under a hood, only one side of which is open. A current of air is maintained through this opening sufficient to carry the vapors away from the breathing zone of the operator. Since carbon tetrachloride vapor is heavier than air, the exhaust opening is more effective if placed at the bottom. Special precautions should be taken when used in connection with chlorinated waxes, alcohol and perhaps other substances.

Recent statistics[8] prove that the relative mortality of industrial workers is decidedly higher than in the general population. It seems reasonable that a large part of this is due directly or indirectly to industrial poisons, all of which are controllable.

Effects of industrial poisons causing slight morbidity, with loss in efficiency and predisposition to specific disease, are difficult to recognize and this is a field in which addition to our knowledge is urgently needed.

In cases of nephritis, or liver trouble, a past history of excessive or long continued exposure to carbon tetrachloride or similar compounds would be extremely significant, although other factors often prevent the original cause being traced directly to any one compound or condition. In this connection, it would prove extremely valuable if the employer kept a detailed job record of each employee, or if the employee kept an individual diary of this sort.

Carbon tetrachloride is a very valuable substance in industry. It is highly toxic, but much less so than many other materials, and the health hazard is relatively easily controlled. More information is needed concerning its chronic effects and the effects in connection with other poisons.

205 W. Wacker Drive.

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## TWO OF A KIND

She falls in love with a fellow
Who swells with a foreign air;
He marries her for her money,
She marries him for his hair!
One of the very best matches—
Both are well mated in life;
She's got a fool for a husband,
He's got a fool for a wife.

—Exchange.

# IRRADIATION OR SURGERY IN CANCER OF THE LARYNX?

THOMAS C. GALLOWAY, M. D.
EVANSTON, ILL.

Three years ago Beck and Guttmann presented before this section an excellent paper on this subject. Since then several controversial points seem to have been sufficiently clarified to make it worth while to review the question.

It has seemed to me that a rosier picture has gone forth than is justified of the ease, simplicity, normal end result and probability of cure of cancer of the larynx by irradiation. I have fairly recently seen die in our wards two cases which were said to have been exhibited within a few months previously as almost certain cures by radium. One died of recurrence, the other of late radium necrosis. The latter had ulceration and death of cartilage of the treated larynx and that peculiar and fortunately rare state of despair, lost hope, cachexia and weakness that made him quite unwilling to make any effort to live. Also not long since I saw as referee a very early case of a probably five millimeters wide growth toward the anterior end of the cord without fixation or infiltration, who was later operated on by the Jackson technique who should have at least a 90% chance of cure and be left normal for all practical purposes. He had seen the head of a cancer clinic who had left him with the impression that he could be guaranteed a 100% probability of cure without operation. From any results I have seen that hardly seems justified. This does not question the great value in general of radiology in cancer and we should be lost without the help of men working in x-ray and radium in most cancers about the head.

The points I shall wish to make are these:

1. Cancer of the larynx still comes late to its proper treatment and much must yet be done to educate the laity and the profession to the necessity of early diagnosis.

2. Partial laryngectomy or laryngofissure in the proper case is an eminently satisfactory procedure. We should concentrate on it as the ideal to be made available by early diagnosis, slightly widened indications, or more effective modifications.

3. Laryngectomy has reached a high point of perfection as an operation, but leaves so little in life that we are warranted in many cases in substituting for it partial laryngectory, even at greater risk, or irradiation.

4. Irradiation is of considerable value in extrinsic cancer of the larynx and almost the only treatment of value here.

These points will now be taken up in more detail.

Early diagnosis is the most important factor in proper treatment and it should be easy because intrinsic cancer advertises itself very soon by hoarseness, it progresses slowly because of its type and the anatomical factors; it can usually be seen without difficulty by a competent examiner by mirror or direct inspection. Differential diagnosis especially from lues, tuberculosis, syphilis, benign tumors and chronic laryngitis is not hard and biopsy can easily be taken to settle the issue.

With early recognition an ideal result should be the rule. Yet that is far from true in the cases that come in private practice from the most intelligent part of our population. And in a large charity service the cases are rare that are at all amenable to treatment. Ignorance, procrastination, wilful disbelief, lack of courage in facing unpleasant facts and fatalism, both in patient and doctor in spite of all of the education and propoganda that have gone on, still cause fatal delay.

With over an 80% chance of cure with a usable voice and a normal airway, and social and physical living and the zest for life not impaired in the successful case treated early, it should still be shouted to the housetops that persisting hoarseness past the second decade must be explained no matter what examination is required. General anesthesia for direct laryngoscopy if proper inspection can not be done without or early exploratory laryngofissure in the suspicious subglottic case should be done if necessary to prove cancer is not present. The alternative of failure to recognize in time carcinoma of the larynx is so terrible that nothing less is justifiable.

Except for the simple destruction or excision of a small skin tumor, nowhere in the body, I believe, is there a more satisfactory procedure for cancer than the St. Clair Thomson laryngofissure or one of its modifications. The operative mortality should be well under one per cent. and in a large series of cases by Jackson, New, Gluck-

Read before Section on Eye, Ear, Nose and Throat, Illinois State Medical Society. Peoria, May 19, 1937.

Sorensen and others the permanent cures have varied from 82 to 88%. It usually leaves a normal airway, a voice that may even fill a pulpit and an individual who is not shut off by himself or others from full social enjoyment. The technique is relatively simple. In the Thomson operation the tissues are divided exactly in the midline, the cartilage is separated from its perichondrium on both sides and is excised, collapsing the soft tissues for easy inspection and removal of the affected medial wall of soft tissue back to the arytenoid. The Jackson technic of first splitting the cartilage before opening the larynx and elevating the soft tissues only on its medial face makes possible more nearly restoration of the normal voice box, but at times the cartilage may slough prolonging the healing and leading to more distortion in the end. The procedure is also somewhat more difficult. It probably is less safe because possibly affected cartilage is not removed. It has one slight disadvantage that radium x-ray can not be used so effectively if recurrence occurs, as shown by Ledoux and Harmer, as when the cartilage is gone. It is better when the tumor has grown across the anterior commissure and seems to be growing in popularity.

Partial laryngectomy should be done in all early cases with involvement of the anterior half or two-thirds of the cord when it is unfixed or slightly fixed and does not extend to the ventricular band. If the tumor is of grade I or II the operation may be used though the growth has infiltrated. Posterior involvement contraindicates this type of operation but I have successfully used it with electrocoagulation even here, but healing is slower and if one must sacrifice any of the party wall esophageal overflow or leak is likely and laryngectomy is a much more satisfactory procedure. Hayes Martin in his very fine recent exposition has advocated widening considerably the indications for partial laryngectomy with removal of a considerable part of even both thyroid ala if necessary and this seems almost as safe and a better procedure than laryngectomy in even fairly advanced cancer if confined to the front of the larynx. His ingenious laryngostomy tube and laryngostat for protracted irradiation under inspection of the open larynx also seem promising.

If all carcinoma of the larynx were intrinsic, and if it were anterior without cord fixation the laryngologist and his patient would find life rosy and probably the radiologist would have little to do here. The real problem comes when the case has advanced beyond the stage where laryngofissure is usually conceded, although here I should extend my indications using diathermy to clear up doubtful borders at somewhat greater risk for the infinitely more satisfactory end result.

Laryngectomy, as Mackenty showed, can give with some selection of material 76% of cures and many patients adjust themselves to a neck fistula and impaired voice very well. Many however scarcely find life worth living. For such cases it is perhaps debatable whether irradiation is not a better choice. In tuberculosis, nephritis, diabetes and other conditions which make the operative risk high as pointed out by Jackson irradiation should probably be done.

X-ray and radium are not so simple and easy as often supposed. If employed they must be used in dosage and for a time that may produce quite unpleasant effects including marked epidermitis and mucositis, drying, dysphagia, occasional severe edema, or even periochondritis. Early and late irradiation necrosis is always possible and it is a question now with us where intensive x-ray treatment is given whether an early tracheotomy is not advisable. Kadranka and Bardet report lighting up of apical tuberculosis in 43% of a series of neck malignancies treated by x-ray. Of course the x-ray or radium must be given in adequate dosage, properly fractionated by a man who has not only adequate equipment, training and experience but also the courage to carry his treatment to the absolute limit of normal tissue tolerance.

The histological type should have some weight in deciding as the more anaplastic cell type, toward grade III or IV of Broders though less common in the larynx should veer the scales toward irradiation.

If the tumor is from the first or has become extrinsic, then the resource with rare exceptions is in irradiation. Of course it is not fair to x-ray or radium to expect them to control easily carcinomata which have eroded cartilage or become infected or markedly extended or given glandular metastases which are as a rule more resistant than the original growth. Yet usually if there

is any chance irradiation at this stage will give it.

Ventricular band carcinoma which has extended over the rima is usually of a more radiosensitive type and should be given to irradiation.

Post cricoid carcinoma is likely to be of a less mature type, is relatively advanced as a rule when discovered and should nearly always be treated by irradiation. Its removal would involve not only laryngectomy but removal of the upper esophagus as well—a dangerous procedure with far less chance of cure than with irradiation in which the end result would be so much better with nearly normal function.

The epiglottis may be the seat of a well localized fairly mature type cancer in which the cartilaginous tumor bed may make the response to x-ray uncertain. Its amputation with electrosurgery on the other hand using suspension is not difficult, will not open up avenues for metastases and may even leave conditions better for irradiation if the growth proves to have involved the base or the adjacent tongue. Carcinoma which may have broken through the anterior commissure may likewise be amenable to laryngofissure with electrocoagulation as in the notable case reported by Sonnenschein in which Mackenty refused to do laryngectomy though the patient had no recurrence after seven years by the more simple procedure.

As to the choice between radium and x-ray that perhaps had better be left for debate by the exponents of both. Regaud saw no specific advantage in either. And as to treatment by high and low voltage it is to be remembered that Coutard's results were for the most part obtained by not over 200 kilovolts. What is more important is that the operator have the time, the patience, the standing and the courage that he will if necessary give treatment up to the absolute limit of normal tissue tolerance even at the expense of considerable suffering and temporary alteration of neck structures.

It should be recognized also that x-ray, radium and surgery may all complement one another.

No temporizing under-treatment with irradiation that may make permanently resistant the tumor should be employed. And its use should be withheld until it is positively indicated and then used in full dosage. It is wise I think not to irradiate preoperatively. It also is wise I think ordinarily not to attempt laryngectomy when irradiation has failed, though Harris reports that this was possible where high filtration and low amperage were used. The nutrition is impaired, the wounds do poorly and most of such patients die. There is an interval immediately on subsidence of such reaction, usually within six weeks of beginning of treatment, when, if it is apparent that irradiation will not succeed, surgery may be possible and at the County Hospital we have had some success in such cases.

If surgery fails, especially if there is wound recurrence, after laryngofissure without glands then full irradiation should I think be employed and may I think give some promise of success. The previous removal of cartilage will aid here. It should not be given as a half hearted routine postoperatively but withheld until recurrence is definite.

This discussion has been concerned too much perhaps with an ideal condition—early intrinsic carcinoma with a laryngofissure, which alone at present gives highly satisfactory results in cancer of the larynx. But emphasis has advisedly been so placed that we may get to general men the importance of the early warning of hoarseness so that for ourselves and our patients we may dispel the fear of what may after all turn out to be hardly more than one of the minor annoyances of life.

## DISCUSSION

Dr. H. E. Davis, Chicago: I feel somewhat embarrassed to stand before nose and throat men and discuss this subject which belongs in their field.

Early diagnosis of these lesions should not enter into my discussion. It is most important and I cannot see any reason why the cause of persistent hoarseness should be neglected.

One of the principal reasons for giving preparatory external irradiation in the treatment of malignancies of the larynx is because practically all of these lesions are infected. External irradiation apparently reduces the infection and if given preparatory to other measures of therapy, I think it is of definite value. Even though the tumor is not completely destroyed by external irradiation, it is placed in a position of recession rather than progression. When the tumor is first seen it usually is in a progressive stage. If it can be placed in a recessive stage, it is in a more favorable condition for local therapy. The failure of completely destroying many of these lesions by external irradiation is due to the inability to deliver adequate dosage to the tumor area. We are aware that many malignancies require 6 to 8 erythema doses of irradiation for com-

plete destruction. It is impossible to deliver such a dosage by external irradiation alone because of the overlying structures in the neck. This dosage may be delivered in a period of two or three months but such protraction tends to increase the resistance of the cells.

It is my opinion that by adopting a combined radiological and surgical viewpoint in the treatment of these malignancies better progress will be made.

Dr. Thomas Galloway, Chicago (closing): In our head cancer team three men represent their own specialties—Dr. Davis, radium, Dr. McNattin, x-ray, and myself, surgery. We keep each other in line, and I think there is no question that doing so we get results not otherwise possible.

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## THE TREATMENT OF HYPOGENITALISM IN THE MALE

W. O. Thompson, M. D.,
N. J. Heckel, M. D.
A. D. Bevan, M. D.
AND
P K. Thompson, M. D.
CHICAGO

This paper will deal with an increase in the size of the genitalia noted in treating boys for undescended testes with an anterior pituitary-like principle, and its application to hypogenitalism.

Interest in the treatment of undescended testes has been aroused in the last few years by the use of this material. The large percentage of successful results (70% on the average) reported from its use seemed questionable to some surgeons who are familiar with the pathological anatomy of undescended testes. We, therefore, formed a group consisting of a surgeon, a genitourinary surgeon, and an internist to study the problem.[1] Contrary to many reports, we were able to produce descent in only 7 of 28 patients (25%), but did produce a striking stimulation of genital growth in many instances. In some boys from 4 to 9 years of age stimulation of growth was so marked that premature puberty was produced. The penis and scrotum became as large as those of a normal adult, there was an enlargement of the prostate, a growth of pubic hair, a change in the pitch of the voice, and in one instance, growth of hair on the sides of the face. The increase in the size of the penis, scrotum and prostate was much more striking than the increase in the size of the testes. Growth of the genitalia was produced in 50% of the boys with undescended testes and in 35% the growth was marked. The reason for the striking variation in response to this stimulus is not clear.

The development of premature puberty in the treatment of undescended testes is undesirable and raises the question as to the age at which treatment should be started. It is not yet known what harmful effects are associated with premature puberty resulting from the use of this material. So far no retardation of skeletal growth has occurred, but it is too early to be certain that there will not be retardation. When the administration was discontinued, the increase in the size of the genitalia stopped and in a few instances some regression in size occurred. Premature puberty does not result in from 6 to 8 weeks of treatment even with large doses, although in some patients a well marked increase in size will occur. In all but one of our successful cases descent took place within 9 weeks. Continuing the treatment for a much longer period in the hope that descent may occur eventually not only may fail to produce the desired result, but it may cause abnormally large genitalia. Treatment covering a period of 8 weeks is rarely harmful so far as can be determined at present. If descent fails to occur, the treatment is still of value because it causes growth of the parts involved in descent, and seems to make it easier to bring the testis into the scrotum at the time of operation. Thus, with careful control, induction of premature puberty can be avoided and when the administration of this material is combined intelligently with surgery, it represents an important therapeutic advance. Its administration may also be useful in some instances in causing descent of testes not brought quite into the scrotum at the time of operation because of shortness of the structures involved. It may also facilitate the correction of hypospadias and other genital anomalies by causing growth of the parts involved preliminary to operation.

The growth of the genitalia in boys with undescended testes, most of whom are of normal body contour, led us to try the administration of the A. P. L. material in boys with hypogenital-

From the Departments of Medicine and Surgery, Rush Medical College of the University of Chicago, and the Presbyterian Hospital, Chicago.

Read before Section on Medicine, Illinois State Medical Society, May 19, 1937, at Peoria.

ism, most of whom are of the Fröhlich type. Growth of the genitalia was produced in 9 of 12 patients (75%), although so far no case of premature puberty has resulted. The big problem again is the age at which treatment should be started. This question can not be answered until we know more precisely what rôle the testis plays in development before puberty. We are inclined to favor treatment as soon as hypogenitalism is recognized, although details of treatment are still to be worked out. We have found the material of value in boys up to the age of 19 and have, indeed, produced growth of the genitalia in a man 37 years of age. However, after the age of puberty, the susceptibility to the growth stimulus appears to be much less.

The material does not affect the basal metabolism or the body weight. Since many boys with hypogenitalism have a low metabolism and are obese, the correction of these abnormalities is an important part of the treatment, which should, therefore, include an adequate weight-reducing diet and the administration of desiccated thyroid. To prove that the material was effective, most of our boys received no treatment except the A. P. L. principle. It would be desirable to have a pituitary extract which would correct both the hypothyroidism and the hypogenitalism, which may be secondary to failure of the anterior lobe of the pituitary. Pituitary extracts, however, are unsuitable for routine clinical use at present and the problem must be attacked indirectly. The most important application of the anterior pituitary-like principle in the male would appear to be the treatment of hypogenitalism, and its administration in this condition represents an important therapeutic advance. It would appear that the outlook for boys of the Fröhlich type has been completely altered.

SUMMARY

We have observed marked stimulation of genital growth from the use of an anterior pituitary-like principle in the treatment of boys with undescended testes and hypogenitalism. When combined intelligently with surgery, it represents an important advance in the treatment of undescended testes. However, premature puberty may result if the treatment is continued too long. The most important application of the anterior pituitary-like principle is in the treatment of hypogenitalism, the outlook for which has been completely altered. Since this material is a powerful therapeutic agent, its administration should be carefully supervised, particularly in the treatment of undescended testes.

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In the treatment of both undescended testes and hypogenitalism we used Follutein of E. R. Squibb and Sons in doses of from 600 to 1200 rat units per week; and A. P. L. prepared by Ayerst, McKenna and Harrison after the technique of Dr. J. B. Collip, in doses of from 600 to 21,000 rat units per week.

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## DISCUSSION

Dr. Frank A. Norris, Jacksonville, Illinois: I am very glad to hear this conservative paper on the treatment of this condition and, being a general surgeon, most interested in undescended testes. We were taught that degeneration occurred early in testes that were left in the abdomen and that if operative interference was not done early before puberty, it was not worth while bringing the testes into the scrotum. This condition is not a common one and many have been skeptical about the treatment, but I think it is worth while research and should be continued as it seems to have had a very positive helpful effect in the treatment.

Dr. Norris J. Heckel: I would like to present two lantern slides of patients which illustrate the errors that can be made in the diagnosis of true undescended testes.

The first is the picture of a young boy who has a migratory type of undescended testes. If such a patient be included in a series treated with extract of pregnancy urine, the results are bound to be more favorable. However, such individuals need no treatment at all and usually when the patient reaches the age of puberty the testes remain permanently in the scrotum.

The next slide represents a drawing made at the time of operation. It shows, as you can see, the testis and cord bent upwards in the abdomen and bound down by adhesions to the external oblique. In our opinion, the use of hormones in such instances will not cause descent.

I should like to emphasize what Dr. Thompson has said, that this material is a powerful therapeutic agent and should not be used over a long period of time in the treatment of undescended testes.

Dr. Willard O. Thompson, Chicago (in closing): I heartily agree with what Dr. Norris and Dr. Heckel said. I do not want to create the impression that we had hoped to do much with these boys with undescended testes who were beyond the age of puberty. We have included a few of them, mostly to test the possibilities of this material as a growth stimulating agent. It seems to me that in the treatment of undescended testes the use of this material represents a definite therapeutic advance. It is important that it be combined intelligently with surg-

ery in many instances. In some of our patients in whom descent failed to occur, surgical procedures have been carried out and in every instance we have found anatomical factors making descent difficult or impossible. However, this material, by stimulating the growth of the parts involved in descent seemed to make it easier to bring the testis into the scrotum at the time of operation. While surgery is necessary in most cases of undescended testes, it works best when combined with the administration of the anterior pituitary-like principle. We believe this material should be administered prior to operation in every instance for a period of at least two months, although the exact period is still to be worked out.

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### STUDIES WITH HUMAN INFLUENZA VIRUS: DURING INFLUENZA EPIDEMIC OF 1936-1937

Thomas Francis, Jr., T. P. Magill, M. Dorothy Beck and E. R. Rickard, New York (*Journal A. M. A.*, Aug. 21,1937), are of the opinion that while their series of twenty-eight patients is small, they appear representative of the epidemic of influenza which occurred in New York City during the past winter. Furthermore, the results of the studies carried out among these patients were striking in their uniformity. The virus recovered during this epidemic either by the inoculation of ferrets or by direct transmission to mice was the same as that which has been isolated in recent years during epidemics of influenza in different parts of the world. The high percentage of clinical cases of influenza in this group in which the virus was actually demonstrated emphasizes the close relationship between the disease and the presence of virus. Moreover, the demonstration of virus in the nasopharynx of a patient was regularly associated with a subsequent rise of antibodies in the patient's convalescent serum, as measured by the mouse protection test or the complement fixation test. The agreement between the recovery of virus and the development of antibodies serves to indicate that the antibody response is a direct response to infection with influenza virus and can be considered as positive evidence of the disease even though virus is not recovered from the patient's throat. This is further suggested by the negative results with all procedures in four cases of incidental bacterial infection observed at the same time. It appears, therefore, that the demonstration of human influenza virus and the development of antibodies to the virus either jointly or alone may be sufficient to warrant a diagnosis of epidemic influenza. The application of these results permits the more accurate charting of the clinical boundaries of epidemic influenza and by closer association of laboratory procedures with careful clinical observation may serve as a guide in the study of other diseases of similar clinical characteristics.

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### SPECIFIC FEBRILE REACTION TO SULFANILAMIDE: DRUG FEVER

In a series of 134 cases of various infectious conditions treated with sulfanilamide, P. O. Hageman and Francis G. Blake, New Haven, Conn. (*Journal A. M. A.*, Aug. 28, 1937), encountered a characteristic febrile reaction (drug fever) in twenty-one cases. Characteristics that distinguish this complication are fever occurring at a definite interval after the institution of sulfanilamide therapy with or without an accompanying morbiliform rash. In the majority of instances the reaction appeared between the seventh and tenth days of sulfanilamide therapy, but in a few instances it came on as early as the fourth or as late as the thirteenth day. The onset of the febrile response was quite abrupt in many instances. Malaise, nausea, itching and tinnitus were the only subjective symptoms noted accompanying drug fever. A rash accompanied the febrile reaction in nine cases. It is usually a maculopapular erythema, but definite hemorrhagic lesions as well as urticaria-like wheals were noted. Laboratory data obtained during drug fever were variable. Leukocyte counts varied from 7,000 to 48,000, and the percentage of polymorphonuclear neutrophils varied from 63 to 95. Eosinophils were present in one-half of the cases and ranged from 1 to 6 per cent. Attempts to demonstrate the presence of precipitins for sulfanilamide in the blood serum during and following the reaction have failed, as have attempts to demonstrate sensitivity by patch and intradermal tests. Passive sensitization tests in human beings and guinea pigs have also yielded negative results. Attempts to produce anaphylaxis and skin hypersensitivity in guinea pigs have likewise failed. The similarity between drug fever and serum sickness is rather striking. The fact that the reaction occurs after the drug has been decreased in dosage or even discontinued suggests that it is not the immediate concentration of sulfanilamide in the body at the time of the reaction which is responsible for drug fever, but rather that sulfanilamide itself or in a combined or changed form is antigenic. Thus far attempts to throw light on the mechanism of the reaction have failed. As far as is known, drug fever has produced no permanent injury in this group of cases. Its occurrence, however, creates distinct diagnostic difficulties, especially in the absence of a rash and in cases in which the fever of the disease merges with drug fever.

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"Our new minister is simply wonderful. He brings things home to you that you never saw before."

"That's nothing. I've a laundryman who does the very same thing."

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## Society Proceedings

### GREENE COUNTY

A special clinical meeting of the Greene County Medical Society was held in the dining room of the Hotel Lindsey in Carrollton, Friday evening, July 23.

The subject for discussion was Blood Pressure, with special reference to Hypotension. Dr. Wm. H. Garrison, of White Hall, presented a patient and opened the discussion. A profitable round table discussion followed, lasting an hour.

Dr. A. K. Baldwin of Carrollton presented two case reports, which were very interesting and instructive.

The Society voted unanimously in favor of cooperating with the State Department of Public Welfare in the matter of a clinic for crippled children to be held in White Hall the last week in August.

W. H. GARRISON,
Secretary.

## Marriages

ELMER SHERMAN ALLEN, JR., Arcola, Ill., to Miss Jane Chloe Jarman in Oklahoma City, June 30.

FRED J. CARLSTROM to Miss Myrtle Heim Puckel, both of Rockford, Ill., in June.

ADELBERT LEROY SPILLER, JR., Grayville, Ill., to Miss Ann Scharp of Cleveland in Princeton, Ind., in May.

## Personals

Dr. Samuel M. Feinberg, Chicago, was the guest speaker before the Hancock County Medical Society in Hamilton, July 21; he discussed hay fever.

Dr. Richard Clark Benkendorf, Chicago, has been appointed superintendent of the Elmgrove Sanatorium, Bushnell, succeeding Dr. Arthur K. Drake, resigned.

Dr. Edward Ross, Alton, addressed the Madison County Medical Society at the Alton State Hospital, August 6, on "Dementia Praecox and Its Relationship to General Practice."

The resignation of Dr. Frank J. Jirka as health commissioner of Illinois, effective September 1, was announced in the newspapers, August 8. His successor has not been appointed. Dr. Jirka has held the position since 1933. He graduated from Northwestern University Medical School in 1910 and is assistant professor of surgery at the University of Illinois College of Medicine, Chicago.

Doctor Winston H. Tucker of Springfield has been appointed Health Commissioner of the City of Evanston, effective September 1, 1937. Doctor Tucker has been an Epidemiologist on the staff of the Division of Communicable Diseases of the State Department of Public Health for the past three years, and during the past year has been in charge of organization of full-time district health units throughout the state. The new Health Commissioner was selected by a committee composed of five physicians representing the Evanston branch of the Chicago Medical Society. He succeeds Doctor John W. H. Pollard, who has been Health Commissioner of Evanston for the past twelve years, and who recently resigned because of ill health. Doctor Tucker was Secretary of the Section on Public Health and Hygiene of the Illinois State Medical Society during the past year, and during the present year is Chairman of the Section.

The August exhibit in the window of Marshall Field & Company Annex Building was devoted to the subject of HAY FEVER. The exhibit included mounted specimens of hay fever producing plants and pollen, furnished by S. M. Feinberg. The window attracted considerable attention.

Drs. Paul H. Harmon, Chicago, and Winston H. Tucker of Springfield addressed the Macoupin County Medical Society at Carlinsville on Tuesday, July 27, on "Poliomyelitis" and "The Health Examination for Marriage," respectively.

Dr. Max Thorek has been made National Delegate to the International Congress of Hepatic Insufficiencies which meets in Vichy, France, in September, 1937.

Dr. Irving F. Stein addressed the Exchange Club of Waukegan, Illinois at a luncheon meeting on Tuesday, August 10, on the subject of "Prenatal Care and Birth Control."

Drs J. T. Gernon of Chicago and Paul H. Harmon, of Springfield addressed the Henry County Medical Society August 4, on "Some Clinical Experiences in the Treatment of Urinary Tract Infections with Sulfanilamide" and "Poliomyelitis" respectively.

Dr. Guy M. Cushing was the guest speaker at the meeting of the Battle Creek, Michigan, Rotary Club on August 16.

The dedication of a huge boulder to the memory of Dr. Stewart Craig Thomson took place on the lawn of Byron school, August 1. Dr. Thomson was killed in an automobile accident, Oct. 30, 1931, near Byron. The boulder weighs nearly a ton and is inscribed with words commemorating the life and service of Dr. Thomson, who exemplified the typical "country doctor," newspapers reported. August 1 would have been his sixty- seventh birthday.

## News Notes

—What was said to be the seventh case of Rocky Mountain spotted fever ever reported to

the state department of health occurred in an 8-year old boy at Grafton, who had been ill since June 25, according to a newspaper account July 26. After blood specimens showed a positive reaction to the Weil-Felix test, the child's parents recalled that he had been bitten by a tick several days before he became ill.

—Camp Owassippi, near Muskegon, Mich., where 250 Chicago boy scouts had been spending a two-weeks' vacation, was closed August 16, following an outbreak of infantile paralysis which resulted in the death of one boy and the serious illness of two others, the Chicago *Tribune* reported. The boys will return to their homes, which will be placed under quarantine. So far this month, there have been four other deaths and thirty-two cases of infantile paralysis in Chicago as compared with three deaths and twenty other cases of the disease during the first fifteen days of August 1936.

—The Institute of Medicine of Chicago offers the Joseph A. Capps Prize of $500 for the most meritorious investigation in medicine or in the specialties of medicine. The investigation may be also in the fundamental sciences, provided the work has a definite bearing on some medical problem. Competition is open to graduates of Chicago medical schools who completed their internship in 1935 or who completed one year of laboratory work in 1936. The winner of the prize will be expected to present the results of his investigation before the institute at some meeting in 1938, the time to be designated later. Manuscripts must be submitted to the secretary of the institute, 86 East Randolph Street, Chicago, not later than December 31.

—The Chicago Medical Society held its annual golf tournament at the Medinah Country Club, July 28. Three hundred persons, including guests, played in the tournament. Dr. Edward A. Brucker, with a score of 79, won the Vanderslice Memorial Cup, the principal award for the officers of the society. Dr. Hubbard P. Saunders, with an 81, placed second, winning the Councilor's Trophy. Dr. Frank S. Needham, Oak Park, Ill., was third, with a score of 82. Dr. Charles H. Phifer won the Past President's Cup with a 95 low gross, and Dr. James H. Hutton, the low net with a 77. The hospital team tournament was won by Ravenswood Hospital, and Cook County placed second.

—Real Estate for Sale. Physicians' Home built in 1922 by present owner and occupant for home and office. Seven-room brick on tile residence. Natural fireplace. Large Living Room. Hot water heat. Attached garage. Lot 76x150. Situated on Main Street in one of Chicago's most thriving Western Suburbs. Practice included $15,000; terms. See H. G. Brueckner, 219 Schiller Street, Elmhurst 2023.

—Nine full time district health units have recently been set up in Illinois, the first of twenty to be financed jointly by the state department of public health and the U. S. Public Health Service under the social security act. Following are the names of the newly appointed superintendents and the counties in their districts:

Dr. Wellington C. Van Wormer, Homewood: Cook, DuPage and Will counties.

Dr. James A. Poling, Freeport: Stephenson, Carroll, Jo Daviess, Lee and Ogle counties.

Dr. Carl A. Peterson, Moline: Bureau, Henry, Mercer, Rock Island and Whiteside counties.

Dr. Sandor Horwitz, Peoria: Marshall, Peoria, Putnam, Stark, Tazewell and Woodford counties.

Dr. Loran E. Orr, Greenview: Cass, Logan, Mason, Menard and Sangamon counties.

Dr. Nettie A. M. Dorris, Paris: Champaign, Coles, Douglas, Edgar and Vermilion counties.

Dr. Joseph L. Bryan, Xenia: Clay, Edwards, Jefferson, Marion, Wabash and Wayne counties.

Dr. Roland R. Cross, Dahlgren: Franklin, Gallatin, Hamilton, Saline, White and Williamson counties.

Dr. Lewis S. Barger, Golconda: Alexander, Hardin, Johnson, Massac, Pope, Pulaski and Union counties.

—The state department of public health, through the University of Illinois College of Medicine, Chicago, and in cooperation with the educational committee of the Illinois State Medical Society, is offering courses in obstetrics and pediatrics for registered physicians of the state. A registration fee of $10 should accompany the application to take the course and checks should be made payable to the university. Applications should be sent to Mr. G. R. Moon, examiner and recorder of the Chicago Professional Schools, University of Illinois, 1853 West Polk Street, Chicago.

## Deaths

ALVAR ANDERSON, Chicago; Northwestern University Medical School, Chicago, 1932; on the staff of St. Joseph's Hospital; aged 32; died suddenly, June 23, of barbiturate poisoning.

FRANK W. BAYLOR, Chicago; Hospital College of Medicine, Louisville, Ky., 1904; Hahnemann Medical College and Hospital, Chicago, 1907; a Fellow, A. M. A.; attending surgeon to the Alexian Brothers, Henrotin, Chicago Memorial and Columbus hospitals; aged 54; was killed, July 23, in an automobile accident near Lebanon, Ind.

EDWARD V. BROWN, Woodstock, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1888; aged 81; died June 4, of chronic myocarditis.

JOHN H. GREGORY, Eldorado, Ill.; Rush Medical College, Chicago, 1896; member of the Illinois State Medical Society; served during the World War; aged 63; died, May 23, of carcinoma of the stomach.

JOHN I. GROVES, Champaign, Ill.; Hahnemann Medical College and Hospital, Chicago, 1880; aged 83; died, May 15, of mitral insufficiency.

DANIEL FRANCIS HAYES, Chicago; Northwestern University Medical School, Chicago, 1912; a Fellow A. M. A.; assistant clinical professor of surgery, Loyola University School of Medicine; Fellow of the American College of Surgeons; served during the World War; on the staffs of St. Annes and Cook County hospitals; aged 48; died, May 11, of coronary thrombosis.

HARRY GRIFFITH HIRSCHLE, Canton, Ill.; Northwestern University Medical School, Chicago, 1912; a Fellow, A. M. A.; served during the World War; past president of the Fulton County Medical Society; on the staff of the Graham and Murphy Hospital; aged 49; died, May 14, in Rochester, Minn., of pneumonia.

IRA D. KELSHEIMER, Paxton, Ill.; Northwestern University Medical School, Chicago, 1907; a Fellow, A. M. A.; served during the World War; secretary and past president of the Ford County Medical Society; aged 57; died, May 29, of coronary thrombosis.

ROBERT CRUMP KING, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Illinois State Medical Society; aged 60; died, May 31, of heart disease.

LEROY PHILIP KUHN, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; a Fellow, A. M. A.; fellow of the American College of Surgeons; president of the staff of the Lutheran Memorial Hospital; attending surgeon to the Columbus Hospital, associate surgeon to the Augustana Hospital; chief surgeon to the Lumbermen's Mutual Casualty Company; served during the World War; aged 57; died, July 23, at his summer home in Three Rivers, Mich., of heart disease.

BURTON WILSON MACK, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Illinois State Medical Society; Fellow of the American College of Surgeons; assistant clinical professor of surgery, Loyola University School of Medicine; on the staff of St. Anne's Hospital; aged 66; died, June 7, at his home in Oak Park, Ill., of carcinoma of the prostate.

JOSEPH LEGGETT MILLER, Chicago, since 1924 clinical professor of medicine at the University of Chicago, died suddenly of heart disease, August 6, at a mountain ranch near Great Falls, Mont., aged 69. Dr. Miller was born in Kewanee, Ill., Nov. 24, 1867. He was educated at the University of Michigan, Ann Arbor, where he received the bachelor of science degree in 1893; in 1895 he received the medical degree from Northwestern University Medical School in Chicago. From 1897 to 1924 he was at Rush Medical College, serving as instructor of bacteriology from 1897 to 1899, instructor in medicine from 1901 to 1905, assistant professor from 1905 to 1909, associate professor from 1909 to 1919, and professor from 1919 to 1924. He was secretary of the Section on Practice of Medicine of the American Medical Association from 1903 to 1908; chairman, 1908-1909, and in 1928 a member of the House of Delegates. He was a member of the Association of American Physicians, the American College of Physicians, the American Society for Clinical Investigation and the American Committee for the Control of Rheumatism of the Ligue Internationale. In addition, he had served as president of the Chicago Society of Internal Medicine and the Institute of Medicine of Chicago. During the World War, he served first as major and later as lieutenant colonel in the medical corps of the U. S. Army. In 1933 he received the honorary degree of doctor of science from the University of Michigan. He was attending physician to St. Luke's Hospital and formerly attending physician to the Cook County Hospital. Dr. Miller also served the American Medical Association as editor in chief of the *Archives of Internal Medicine* from its inception in 1909 until 1931. He was the author of numerous contributions to medical literature and was especially influential as a practitioner of clinical medicine.

FREDERICK WILLIAM RISSER, Strasburg, Ill.; St. Louis Medical College, 1886; aged 74; was found dead, May 7, of cerebral hemorrhage and arteriosclerosis.

EDWARD WARREN SIKES, Freeport, Ill.; Hahnemann Medical College and Hospital, Chicago, 1902; member of the Illinois State Medical Society; president of the Stephenson County Medical Society; on the staffs of the Evangelical Deaconess Hospital and St. Francis Hospital; served during the World War; aged 61; died, May 5, in the Presbyterian Hospital, Chicago, of acute ascending suppurative hepatitis.

BAYARD TAYLOR STEVENSON, Harvey, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; a Fellow, A. M. A.; on the staff of the Ingalls Memorial Hospital; aged 64; died May 29.

JAMES EDWIN WATSON, Alton, Ill.; American Medical College, St. Louis, 1894; member of the Illinois State Medical Society; aged 69; died, May 10, of heart disease.

JOSEPH WILLIAM ZEH, Chicago; Chicago College of Medicine and Surgery, 1909; aged 64; died, May 12, of a self-inflicted bullet wound.